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appendix: summary of public comments

on the Draft
Water Quality Control Plan
and Environmental Impact Report
Sacramento-San Joaquin Delta
and Suisun Marsh



August 1978

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PLATE I

LIST OF AGENCIES, GROUPS AND INDIVIDUALS
SUBMITTING COMMENTS

Alameda County Water District	
Assemblyman Daniel E. Boatwright	
Association of Bay Area Governments	(ABAG)
California Department of Fish and Game	(Fish and Game)
California Department of Food and Agriculture	
California Department of Parks and Recreation	(DPR)
California Department of Water Resources	(Department)
California Regional Water Quality Control Board, Central Valley Region	(Region 5)
California Regional Water Quality Control Board, San Francisco Bay Region	(Region 2)
California State Lands Commission	(SLC)
Castaic Lake Water Agency	
Central Delta Water Agency	(CDWA)
Central Valley East Side Project Association, County of Tulare, Friant Water Users Association, and Westlands Water District	(CVESPA)
City of Antioch	(Antioch)
Contra Costa County Water Agency	(CCCWA)
Contra Costa County Water District	(CCCWD)
County of Sacramento	
County of Ventura	
Crown Zellerbach Corporation	(CZ)
Delta Environmental Advisory Committee	(DEAC)

Dudley Ridge Water District	
East Contra Costa Irrigation District	(ECCID)
Environmental Defense Fund	(EDF)
Fibreboard Corporation	(Fibreboard)
Friends of the Earth	(FOE)
Friends of the River	(FOR)
Governor's Office of Planning and Research	(OPR)
Kern County Water Agency	(KCWA)
League of Women Voters of the Bay Area	(LWV)
Metropolitan Water District of Southern California	(MWD)
Mojave Water Agency	(MWA)
North Delta Water Agency	(NDWA)
Pacific Coast Federation of Fishermen's Associations, Inc.	
San Francisco Bay Conservation and Development Commission	(BCDC)
San Joaquin County Flood Control and Water Conservation District	(SJCFCWCD)
San Luis Water District	(SLWD)
Santa Clara Valley Water District	(SCVWD)
Sierra Club	
South Delta Water Agency	(SDWA)
State Water Resources Control Board, Division of Water Rights	
Suisun Resource Conservation District, and California Waterfowl Association	(SRCDD)
Trumbull, Larry - Sierra Club Member	
Tulare County Association of Governments	

Tulare Lake Basin Water Storage District	(TLBWSD)
U. S. Bureau of Reclamation	(Bureau)
U. S. Environmental Protection Agency	(EPA)
U. S. Fish and Wildlife Service	(USFWS)



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I. INTRODUCTION

This appendix contains a summary of the public comments received on the draft Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh (draft Delta Plan) and its Draft Environmental Impact Report (EIR).

The draft Delta Plan and Draft EIR represent the culmination of 32 days of extensive evidentiary hearing initiated on November 15, 1976 and concluded on October 7, 1977. These documents were released for public review on March 15, 1978, followed by a public hearing on May 30, 1978 to receive comments thereon. The hearing record was left open until June 15, 1978 to receive written comments.

As indicated below, many parties commented extensively on the draft plan and Draft EIR. Over 40 parties have submitted extensive oral and written comments. The commenting parties represent a broad spectrum of the public sector including the project operators, federal and state water service contractors, Delta water agencies, municipal and industrial users in Contra Costa County, fish and

wildlife interests, environmental groups, and state, federal, and local agencies. The comments reflect generally the intense competition for Delta water supplies between in-basin and export uses as well as competition among such uses.

In order to satisfy state and federal requirements, the respective concerns and the Board's response to them are contained in this appendix to the Delta Plan and Final EIR. These concerns have been incorporated into the Delta Plan and Final EIR as appropriate.

As indicated in the Delta Plan, the present proceeding has been conducted as a dual hearing pursuant to the water quality control and water right authority of the Board to develop not only this plan, but also to formulate amended terms and conditions for the permits of the Department and Bureau necessary for implementation of the plan. Thus, two documents will be adopted by the Board (the Delta Plan and an accompanying water right decision); together they represent a unified effort by the Board to develop under its full authority a single set of water quality standards to protect beneficial uses of Delta water supplies.

Even though the water right decision was not submitted for public review prior to its adoption, it is wholly consistent with the Delta Plan. Since the two distinct approvals constitute the whole of a single project, the Draft EIR has been prepared and finalized (Final EIR) to cover both actions of the Board (adoption of Delta Plan and water right decision).

These parties' comments have been sorted in this appendix into nine major topical areas, each of which contain a series of related issues. Where pertinent, both sides of an issue have been presented with an indication of the positions of the parties concerned. Immediately following each issue is the Board's response.

In sorting these comments into topical areas, it was not always possible to classify every comment into a precise categorical group. However, we believe that this sorting process will aid the reader in obtaining a better grasp of the controversy associated with each issue. Also, in order to facilitate the reading of this appendix, Plate I of the Delta Plan, which shows the boundaries of the Delta and Suisun Marsh, is attached at the back of this document.

Section II of this appendix addresses the general issues regarding the hearing process and broad policy ramifications. Sections III, IV and V deal explicitly with the water quality standards, and Section VI addresses San Francisco Bay. Section VII addresses concerns expressed regarding the methodology used in the development of the standards as well as suggested refinements to this process.

Section VIII deals exclusively with the specific water right concerns, and Sections IX and X deal with the monitoring and surveillance program and the Draft EIR, respectively.

The specific comments of legislators and the Environmental Protection Agency are set forth in their entirety along with the Board's response in Section XI. Section XII is a catchall for all comments not included in any of the above categories.

Generally, the views of the Department of Water Resources (Department) and the U.S. Bureau of Reclamation (Bureau) are shared by the San Joaquin Valley water service contractors of the federal Central Valley Project (CVP) and water service contractors of the State Water Project (SWP).

Agencies representing users of water in the San Joaquin Valley under federal water service contracts include the Central Valley East Side Project Association, Friant Water Users Association, Westlands Water District and San Luis Water

District. The State Water Project contractors are represented by the State Contractors' Water Rights Committee. The general views of this committee have been presented by the Metropolitan Water District of Southern California and the Kern County Water Agency. The following State contractors have concurred specifically with the views of the above two agencies: Alameda County Water District, Castaic Lake Water Agency, Dudley Ridge Water District, Santa Clara Valley Water District, Tulare Lake Basin Water Storage District and County of Ventura.

Delta agriculture is represented generally by the North Delta Water Agency, East Contra Costa Irrigation District, Central Delta Water Agency and South Delta Water Agency. The San Joaquin County Flood Control and Water Conservation District supports the position of these agencies.

The Contra Costa County Water District represents generally the interest of its municipal and industrial users in Contra Costa County. The views of the salt sensitive paper industries in the vicinity of Antioch are represented by Crown Zellerbach and Fibreboard Corporation. Even though the Contra Costa County Water Agency does not actually provide water service to users in Contra Costa County, it has asserted a general responsibility for protection of uses in the county.

The environmental organizations commenting on the plan include the Sierra Club, Environmental Defense Fund, Friends of the Earth, and Friends of the River. Also, the views of environmental groups have been expressed by the Delta Environmental Advisory Committee (DEAC), which is a special advisory group to the Department of Water Resources consisting of representatives of the major environmental and citizen organizations in the state.

The views of state and federal fish and wildlife agencies are represented by the California Department of Fish and Game, and the U.S. Fish and Wildlife Service. The San Francisco Bay Conservation and Development Commission commented on impacts on San Francisco Bay. Local views on fish and wildlife are presented by the Suisun Resource Conservation District and Pacific Coast Federation of Fishermen's Associations, Incorporated.

In addition to the concerns contained herein, many editorial and minor factual corrections have been made in response to these concerns. These corrections have been incorporated into the Delta Plan and Final EIR.

All environmental reviews required in compliance with the California Environmental Quality Act of 1970 have been completed.

Many of the commenting parties have asked the Board to take actions which are beyond its authority. There are, however, specific statutory limitations on the Board's authority in addition to the physical limitations in available Delta water supplies. Also, the scope of this proceeding is confined to the jurisdiction reserved in permits of the Department and Bureau.

In dealing with new applications to appropriate water, the Board will have a greater latitude in addressing many of the concerns raised herein. It is the intent of the Board to pursue these concerns to the full extent of its authority.

II. GENERAL ISSUES

A. Water Quality Standards

Comment: The standard at Green's Landing in the 1975 Water Quality Control Plan for the Sacramento River Basin (Basin 5A Plan) should be included in the Delta Plan. This standard would relax certain other Delta standards by 1.5 times the amount that the Sacramento River water quality at Green's Landing exceeds 150 mg/l TDS. Inclusion of this standard would be consistent with the Basin 5A Plan standard which allows degradation of the Sacramento River above 150 mg/l TDS 50 percent of the time and above 200 mg/l TDS 10 percent of the time with no absolute maximum. (Department, MWD)

Response: The Green's Landing standard contained in the Basin 5A Plan originated in the so-called November 19, 1965 criteria. These criteria were developed through negotiations by a group consisting of representatives of the Sacramento River and Delta Water Association, the San Joaquin Water Rights Committee, the Department and the Bureau. The criteria generally represent the resulting water quality at various locations throughout the Delta based on satisfying Bureau water quality requirements at the CVP Tracy Pumping Plant.

The Green's Landing criterion is not really a standard but rather a relaxation provision which attempts to take into account the effect of land derived salts. Thus, the specific levels of protection resulting from the Green's Landing criterion do not protect vested water rights. The criterion also limits without legal basis the mitigation responsibility of the projects.

The responsibility for present and future salinity degradation upstream of the Delta in the Sacramento Valley has not yet been determined. Historical data does not show conclusively that substantial upstream degradation has occurred. Under the Bureau's long-term contracts, over one million acre-feet per year of CVP water will be delivered upstream of the Delta in the Sacramento Valley and American River watersheds (Bureau Exhibit 59). Use of this CVP water will contribute to any eventual substantial salinity degradation of the Sacramento River. Incorporation of the Green's Landing criterion into the Delta Plan would place the full burden of upstream salinity degradation on Delta water users. Such a burden would not be consistent with the approach used in the Delta Plan in view of the project's contribution to upstream salinity degradation. Thus, the Green's Landing "standard" has not been included in the Delta Plan.

The exclusion of this "standard" should not pose a problem in meeting the Delta Plan standards during the effective period of the plan, since the mean monthly TDS at Green's Landing has remained well below 150 mg/l most of the time, even during the critical 1976-77 drought. Even though the Green's Landing "standard" of Basin 5A Plan would rarely (if at all) be controlling, it will be specifically superseded by the Delta Plan since it conflicts with the underlying principles of the Delta Plan.

Comment: Standards in the draft plan provide better water quality than that which would occur in the absence of the

projects. This is so because historical data probably does not measure true peak salinity, and also because the use of "average maximum salinity" creates a very conservative standard. Water quality conditions will always be better than the standards, since actual water quality must be kept below the standards due to unpredictable variations in weather, tides and channel depletions. (Department, SLWD)

Response: There are some uncertainties regarding the water quality conditions represented by quality records. However, we are confident that the standards set in this proceeding are both reasonable and attainable. As more experience is gained various refinements could be employed in interpreting and translating the historical data to without project conditions. These possibilities will be explored in the future along with the Board's efforts to better identify the beneficial use needs of Delta water supplies.

The degree that actual water quality conditions match the standards will depend to a large extent on the ability of the projects to "fine-tune" their operations in the Delta. Operating experience gained by the project operators during the 1976-77 drought has already greatly increased their ability to fine-tune project operations toward meeting standards. It is anticipated that the project operators will continue to further refine these capabilities in the future.

Comment: Both Article X, Section 2 of the California Constitution and the Delta Protection Act by reference to the Area of Origin Act (Water Code Sections 11460, et seq.) require that salinity control for beneficial uses be reasonable. This should be clarified in various comments on pages VI-14, VI-23 and VI-24 in the draft plan. (Department)

Response: Ample clarification on this matter is included throughout the Delta Plan, particularly in Chapter I. However, further clarification has been incorporated as suggested in Chapter VI of the plan..

Comment: When the CVP was planned, release of water from storage for enhancement of the Delta was not proposed. We particularly object to your requirement for release of water stored in CVP reservoirs for enhancement of fisheries in the Delta, and we object to the Delta water users enjoying a "free ride" for enhancement of water quality over and above that which would occur in the absence of the projects. (SLWD)

Reponse: The standards in the Delta Plan do not require water quality enhancement for either Delta agriculture and industrial uses or fish and wildlife resources in the Delta and Marsh. On the contrary, both the plan and EIR clearly indicate that the CVP and SWP will not fully mitigate the adverse impacts of their operations on Delta fisheries during the effective period of this plan nor to wildlife resources in the Marsh until October, 1984. Only in the case of public drinking water supplies have standards been established which might provide enhanced water quality to municipal users in the Delta.

Comment: The draft plan fails to satisfy the requirements of the Federal Water Pollution Control Act that beneficial uses shall be protected and the quality of the nation's waters shall be enhanced. (FOE, CCCWD) The Delta Plan should protect all beneficial uses in the Delta, not just those affected by CVP and SWP. (CDWA) The draft plan also violates Board policy against water quality degradation enunciated by Board Resolution 68-16. (CCCWD)

The FWPCA requirement that beneficial uses shall be protected has been satisfied in the Delta Plan. The plan provides substantial improvement in water quality for beneficial uses in the Delta and Suisun Marsh over that provided in existing basin plans (approved by the Environmental Protection Agency in 1975). Exceptions are the industrial uses in Contra Costa County. The period over which salt-sensitive industries will be protected is somewhat shorter than that in the water quality control plan for the Sacramento-San Joaquin Delta Basin (Basin 5B Plan). This level of protection, however, is consistent with the vested water rights of the industrial users.

We are aware of no provision in the FWPCA which mandates the full protection of all beneficial uses at all times. In fact, subsection 303(c)(2) of the FWPCA provides that standards shall be established taking into consideration their use and value for public water supplies, propagation of fish and wildlife, recreation purposes, and agricultural, industrial, and other purposes, and also taking into consideration their use and value for navigation. The California Water Code, however, places an affirmative duty on the Board requiring that such standards provide a reasonable level of protection to beneficial uses consistent with public interest concerns. State law would preclude full protection of beneficial uses where such protection would be unreasonable or contrary to public interest. The Board has found that it would not be in the public interest to provide these industries enhanced water quality in excess of their vested water

rights. In view of this, the Board has determined that protection of the industries' vested water rights is a reasonable level of protection.

We find no conflict between California law which requires reasonable protection of beneficial uses and the FWPCA requirement that beneficial uses be protected.

Even though the Federal Water Pollution Control Act (FWPCA) provides for the enhancement of water quality in the establishment of water quality standards by a state, such enhancement is required only "whenever attainable". Federal regulations (40 CFR 130.17, November 28, 1975) provide that the state should take into consideration environmental, technological, social, economic and institutional factors in determining whether such standards are attainable.

These requirements are interpreted to mean whenever reasonable and in the public interest. Thus, the requirements of the FWPCA for the establishment of water quality standards are essentially the same as those under state law. There is no practical value in setting standards that are unattainable.

As previously indicated, this proceeding has been conducted under the Board's water right and water quality control authority. The levels of protection provided beneficial uses in the Delta and Suisun Marsh under the Delta Plan

recognize the limitations of the Board's authority under its reserved jurisdiction to impose terms and conditions in water right permits of the Department and Bureau. Notwithstanding this dual exercise of authority, the standards contained in the Delta Plan satisfy federal requirements.

Regarding the Board's Resolution No. 68-16 (commonly referred to as the Nondegradation Policy), the guiding principle of this policy is to attain the highest quality possible consistent with maximum benefit to the people of the state. This policy (adopted in 1968) is specifically directed to the Board's regulation of waste discharge permits and applications to appropriate water where existing water quality is better than the quality established in current policies of the Board (such as the basin plans). This resolution permits changes (increase in salinity) in current quality, provided that such changes are consistent with "maximum benefit to the people of the state" and would not unreasonably affect beneficial uses of such water.

The principal instance under the plan where it might be argued that the non-degradation policy should apply is in the standard for the salt-sensitive industries, which would provide a somewhat shorter period of protection than the Basin 5B Plan. The Board concluded in the draft plan that the public interest is best served by establishing standards which recognize the

limited rights of the users to such quality; and thus best develop, conserve and utilize the limited Delta water supplies. Even though there may be an actual salinity increase in the water supplies available to the industries, it is not anticipated that industrial uses would be unreasonably affected by such supplies. However, if the industries desire better quality water, they can obtain such benefits by entering contracts with the project operators.

Comment: Under 1990 conditions, the draft plan (compared to the Basin 5B Plan) would decrease annual Delta outflow by almost one million acre-feet, in favor of increased exports by the water projects. The draft plan does not provide adequate environmental protection. It is not appropriate to think that nothing will happen in the next ten years that will be affected by the Delta Plan. (EDF, FOE)

Response: These comments equate exports with environmental degradation. Annual outflow and annual level of exports are at best a very poor indicator of the environmental effects on the Delta of the draft plan. As explained more fully in the EIR, adverse environmental effects are related to more specific factors and can be limited by restrictions on pumping and by provision of salinity levels at strategic locations during critical times of the year. Most exports during high winter flows have little if any identifiable adverse impacts. In fact, the ability to develop somewhat more water from existing facilities while protecting the Delta will limit the environmental impacts associated with new facilities which might well otherwise be constructed as an alternative water supply.

In addition to this general response, there are reasons to doubt the precise accuracy of the forecast which the comments rely on. The comments on the impact of the plan on average outflow conditions and project exports are based on the Department's 1990 level studies of both the Basin 5B Plan and the draft plan. These studies both assume the construction of additional reaches of the Folsom South Canal with a major buildup in use, and construction and operation of the Mid-Valley Canal, San Felipe Project, Auburn Dam, North Bay Aqueduct and major elements of the Peripheral Canal. Some of these projects have not been authorized or funded. Also, even those projects which have been authorized may be halted or altered. The operation studies also include a number of other more subtle assumptions related to future relaxation of Delta standards, to future Sacramento Valley depletions, and to future development of additional San Joaquin Valley groundwater storage. Consequently, exports and Delta outflow might be substantially different than represented by the Department's studies.

While it might easily be assumed that the relative differences between the studies of the Basin 5B Plan and the draft plan Department did not evaluate the draft plan in its entirety. For instance, the 1990 level draft plan study does not include the effects on yield of meeting the agricultural standards in

the southern Delta. Even more significant, the study does not include any of the policy guidance in Chapter VII of the plan which is provided to assist water development agencies in evaluating possible future water development facilities (i.e., flows for San Francisco Bay and upper estuary productivity). These factors could substantially alter future Delta outflow and exports. Additionally, the Bureau did not evaluate the 1990 effects of the plan, primarily because the Department in their study used the annual Coordinated Operating Agreement which the Bureau felt had some significant deficiencies when applied to 1990 levels. This factor might not affect the two Department 1990 studies equally, and could alter the differences in outflow and exports between the Basin 5B Plan study and the draft plan study.

EDF's detailed comments indicate that the water supply conditions assumed for the 1990 operations study are "a bit fanciful", but contend that impacts based on that study are still valid.

Finally, the effect of the Delta Plan is that water quality standards, which are based on variable runoff conditions in

the Delta, must be satisfied prior to any export. Thus, any proposals for additional facilities or major changes in project operations must be assessed using Delta Plan standards. The Board's future review of standards will focus on the specific needs of San Francisco Bay and upper estuary productivity, and on refinements of the needs of Delta and Suisun Marsh beneficial uses. This review will incorporate ongoing and future research on the needs of the beneficial uses.

Comment: The draft plan allocates available water supplies in the Delta in times of water scarcity. The Board does not have the right to do this, and such allocation violates the principle in California water law that the owner of a senior water right is entitled, in times of water shortage, to all the available water until reasonable needs are served, before a junior appropriator, such as the SWP and the CVP, is entitled to divert. The Board has ignored and violated the plain mandates of the Delta Protection Act to give first priority to satisfying vested rights and public interest needs for water in the Delta and second priority to all exports of water from the Delta to other areas for any purpose.

In most months of most years, historical Delta outflow has exceeded the flows that would result from the draft standards. There is no showing in the draft plan or Draft EIR whether or not the proposed reductions in Delta outflow are an infringement on Delta vested water rights. The draft plan proposed the taking of nonsurplus water by exporters. More technical and scientific studies are needed of the Bay-Delta system to define the extent of truly surplus water. The encroachment of ocean waters into the Delta resulting from upstream diversions was the prime impetus for the construction of the CVP. The draft plan is silent on the point that both the SWP and CVP must provide nonreimbursable salinity control to protect the Delta against the intrusion of ocean waters. (CCCWA)

Response: Although the Board in this proceeding is not adjudicating or determining the validity of individual vested water rights, it must nonetheless identify the extent to which such rights would have been satisfied in absence of the projects to ensure that the operation of project

facilities does not adversely encroach upon those rights. The standards in the Delta Plan ensure that no water to which Delta vested water right holders are entitled will be exported out of the Delta.

The CCCWA comments detail a month-by-month comparison of historical Delta outflow with the outflow that would result from the Delta Plan standards. However, this comparison ignores the uncontrolled flows available to the Delta in most years as a consequence of natural hydrology, and these large flows would not be appreciably reduced during the effective period of the plan. Pages V-5 and V-6 in the Draft EIR discuss and quantify the flows likely to occur under the draft plan, and this analysis is further refined in the Final EIR. Under both cases, the likely uncontrolled flows are identified. The relatively small flow reductions occur during periods of extremely high uncontrolled flows throughout which vested water rights are fully satisfied, and thus, such flow reductions do not constitute an infringement on Delta vested water rights by the SWP and CVP.

The CCCWA contention that the plan proposes a taking of nonsurplus water by exporters does not appear to be consistent with their comments that the extent of surplus flows has not been quantified. In any event, the plan calls for studies to further quantify the needs of Delta and Suisun Marsh beneficial uses, and to identify the uncontrolled

outflow needs of San Francisco Bay. Full consideration will be given to the results of such studies in the Board's periodic review of the standards.

CCCWA also incorrectly states that the ocean salinity intrusion resulting from "upstream diversions" was the prime impetus for the construction of the CVP. The material presented in the CCCWA comments regarding CVP enabling legislation makes no specific mention of "upstream diversions", and appears to be directed more toward the natural phenomenon of salinity intrusion. Finally, regarding the nonreimbursability of salinity control, the plan ensures that Delta vested water rights will not be infringed upon by the SWP and CVP.

Comment: The draft plan attempts to plan with 'no policy, since it does not institute permanent standards and pushes the real decisions into the future, making them dependent upon the decisions of water appropriators. A further problem is the use of preproject levels of protection for beneficial uses. It is unclear precisely what is meant by preproject levels, for on the one hand, reference is made that saltwater intrusion capable of damaging fish and wildlife populations or agriculture was rare in preproject days, and on the other, that the projects represent a significant protection for the Delta in midsummer. Finally, use of the 1000 ppm chloride line is an averaging technique which is inconsistent with the use of differential standards for each time of year, depending on the needs of each beneficial use designated for protection. It is inconsistent because it is a standard of worst case seawater penetration, saying nothing about overall levels of water quality as expressed in salinity. (FOE)

Response: The remarks regarding "planning with no policy" do not reflect a careful reading of the contents of either the draft plan or the Draft EIR. These documents set forth the proceeding initiated two years ago to develop an evidentiary record to formulate Delta and Suisun Marsh water quality standards, the authority of the Board in this matter, specific guiding policies used in the development of standards, an assessment of the Board action, a description of the specific measures which must be taken to implement the standards, and an action program to develop more detailed information on beneficial use needs so that standards can be improved in the future.

Regarding the permanency of the standards, the water quality standards are based on conditions expected to prevail over the next ten years. However, the Board is "not pushing the real decision into the future", but rather recognizes the need for additional information in order to develop meaningful long-term standards. Also, there is considerable uncertainty associated with proposed project facilities to be constructed. The Board concern is not directed toward satisfying the special needs of the projects, as inferred in these comments, but rather at the potential impacts of of these project facilities on beneficial uses in the Delta and Suisun Marsh.

The preproject conditions discussed in the EIR are historical salinity conditions in the Delta during the period 1920-1944. The EIR does not conclude the preproject conditions protected beneficial uses in all but rare circumstances, only that there was suitable water quality to protect many uses in most years. The water quality standards in the plan are based on 1980-level without project conditions, which include upstream depletions attributable to nonproject development in the watersheds tributary to the Delta.

The use of a 1000 ppm chloride line is for demonstration purposes to show the gross effects of salinity intrusion, and was not used in development of standards. We refer FOE to Chapter III of the EIR which discusses the development of 1980-level without project water quality. The data base was the actual four-day grab sample information, and not the location of the 1000 ppm chloride line.

Comment: The best plan cannot be formulated without considering the alternative of water conservation in the export areas. (FOE)

There should be more stringent support of requirements for water conservation and water reclamation projects so that the amount of water available to maintain water quality in the Delta could be augmented. (LWV)

Response: In previous decisions of the Board and its predecessor agency, the uses of water proposed in the SWP and CVP service areas were a paramount issue. These uses were found to be beneficial and in the public interest when subjected to the limitations and conditions expressed in the decisions.

However, in its consideration of applications for additional appropriations by the SWP and CVP, or proposed transfers of water through CVP and SWP facilities involving water rights, the Board will assess conservation and wastewater reclamation programs in the proposed service areas to ensure that these additional water resources will be used in the most efficient manner consistent with the public interest. Also, the Board will continue to encourage and fund studies toward increased conservation and reclamation through its non-point source pollution control programs and funding of public wastewater treatment facilities.

Comment: The plan is an attempt to adjudicate vested water rights in a manner which attempts to quantify and encroaches upon those rights in the Delta. The Board's method of determining riparian rights is incorrect. The draft plan attempts to charge to Delta water users upstream depletions including depletions by junior appropriators. The draft plan attempts to balance the rights of junior appropriators and senior vested right holders, thereby ignoring the priorities recognized in law. (CDWA, CZ, Fibreboard)

Response: The Delta Plan and water right decision assure that SWP and CVP operations will not encroach upon Delta vested rights. The plan provides that the SWP and CVP shall bear the full burden for all project induced impacts which can be currently quantified. Under this proceeding, the Board cannot adjudicate the respective rights of upstream or Delta users. Such a determination would require a full adjudication of the basin.

As for the standards in the Delta Plan, they do not balance junior water rights against senior water rights, but rather are based on established water right principles that Delta senior water rights must be satisfied prior to any exercise of junior rights of the SWP and CVP. The wording which appeared on page I-7 of the draft plan has been revised to clarify this intent.

Comment: The plan should contain a clear statement that the Regional Boards' basin plans are the guiding policy for all water quality objectives not modified by the proposed State Board plan. (Region 5)

Response: Such a statement has been included in the Delta Plan.

Comment: Certain physical changes in the Delta such as the Sacramento and Stockton Ship Channels and flooding of Frank's Tract have increased the Delta tidal prism, thus increasing the freshwater outflow required to maintain specific salinity conditions in the Delta. (Bureau)

Response: The physical changes mentioned in the Bureau comments involve the Sacramento and Stockton Ship Channels and flooding of Frank's Tract. Clearly, none of these substantial changes in the Delta tidal prism were induced by nor benefited Delta users. Also, many (if not most) of the Delta uses were initiated long before these changes occurred.

Even though the ship channels are federal projects, they were not constructed as part of the SWP and CVP. However, both of these projects were authorized and constructed based on a fixed Delta configuration which included the above physical changes. In effect, the projects accepted the Delta as they found it in order to use it as a conveyance facility. As between the Delta users and the projects, it is more consistent with public interest that salinity control responsibilities for these existing physical changes be placed on the projects. Whether the costs associated with providing such salinity control are reimbursable or non-reimbursable is a matter to be addressed by the Department and Bureau.

However, future alterations which substantially increase the tidal prism are a different matter. In such instances, it cannot be said that the SWP and CVP are accepting responsibility

by virtue of their operations in the Delta. It is imperative that any agency which is proposing substantial alteration in the Delta fully mitigate its impacts on the system. Such alterations should not be permitted unless and until an acceptable mitigation plan is developed.

It should be noted that the Delta Plan is based on current Delta configurations. Any major or drastic change (such as the flooding of a Delta island) is not provided for in this plan. Such occurrence must be dealt with on a case-by-case basis. However, assumption of this plan is that such islands will be reclaimed.

B. Waste Discharge Controls

Comment: The Delta Plan and EIR must describe the extent to which existing waste discharge controls and areawide waste treatment management programs deal with Delta salinity loading problems. The plan and EIR should be modified to distinguish the ocean salinity control problem addressed by the Delta Protection Act from the salt loading control problem addressed by basin plans. Limitations on SWP water rights should apply only to the ocean salinity control problems, and only in the context of State water right law. (MWD)

Response: The municipal, industrial and agricultural standards are based on presumed 1980 level without project water quality, which takes into account the changes in Sacramento River flow caused by upstream non-project development. The SWP and CVP are not required to bear the burden of adverse effects of these developments. Waste discharge controls and areawide waste treatment management programs address less than ten

percent of the salt loading to the Delta. The Board has underway a number of conservation and wastewater reclamation programs which should lead eventually to a reduction in salt loading to the Delta from these sources. However, the predominant source of salt loading to the Delta is agricultural return flow. Several programs are underway by the Board and other agencies concerning methods to reduce a number of non-point source pollution problems, including agricultural salt loading. The Board is participating actively with the Department and the Bureau in the Interagency Drainage Program, which is looking at practical solutions to re-use and disposal of San Joaquin Valley high-salinity drainage.

As a major participant in San Joaquin Valley agriculture, the projects have some effects on salt loading to the San Joaquin River. Thus, the projects and many of their water service contractors may share some burden in dealing with salt loading control. Until this matter is resolved, the Board cannot limit the projects' responsibility only to ocean salinity problems. However, the Board will not impose burdens on the projects which are rightly the burdens of others.

Comment: We ask whether the improvements in salinity in the Delta following from abatement actions taken by the regional boards will result in increased exports of water (since less is then needed for salinity control). Perhaps future review of the Delta Plan should include a means of equitably distributing the benefits of such achievements. (Region 5)

Response: The Board in its review of permit terms and conditions under its reserved jurisdiction must ensure that project operations do not encroach upon vested water rights in the Delta. Abatement actions such as those taken by the Central Valley Regional Board to seal the Tuolumne River gas wells have greatly reduced salinity flows to the southern Delta. Any water quality improvements resulting from such abatement actions would go first toward satisfying Delta vested water rights. Also, exports of any savings would be permitted only if Delta rights are not infringed upon by such exports.

C. Peripheral Canal

Comments: The plan and EIR should recognize the Peripheral Canal, should include the State finding on its need, describe State endorsement of its construction, and discuss the effects of both the standards and the Peripheral Canal. (MWD, SCVWD, OPR)

The debate over the draft plan or anything else should not be allowed to impair, deter or delay construction of the Peripheral Canal. (MWA)

The Peripheral Canal, construction of which is not authorized by either the United States or the State, is not properly a part of the plan. We object strenuously to suggestions that the plan should contain statements identifying need for the Peripheral Canal. (SJCFCWCD)

The plan implies that the adverse impacts of reduced Delta outflows and larger Delta exports can only be fully mitigated by construction of the Peripheral Canal. The Board is not authorized to make water development decisions and is confusing planning with political objectives outside its jurisdiction. (FOE)

Response: Section 13145 of the Water Code requires the Board in setting water quality standards to consider future plans of government agencies which look toward the development, utilization or conservation of waters of the state. The principal focus of the Delta Plan is limited to current and anticipated conditions over the next ten years. Project facilities proposed for the future, while relevant to this proceeding, have not been given substantial weight by the Board. In view of the fact that any proposed Peripheral Canal is not expected to be completed for at least ten years, this facility would have no effect on the Delta Plan. The Board concluded that it was not within the proper and effective scope of this plan to take an advocacy position on future facilities. Those decisions are more properly left to other parties.

Comment: The draft plan and Draft EIR perpetuate some old myths on the Peripheral Canal generated in a prior age when science was subservient to politics. The Peripheral Canal will deliver tons of new wastes to the Delta (by not exporting San Joaquin River water) to destroy existing fisheries. It will complete the confusion and hurry the total decimation of anadromous fishes. Use of Sacramento River water to dilute the San Joaquin River portion of the Delta will lead Sacramento salmon into dead-end traps. A diversion dam across the Sacramento River at Hood, part of the Peripheral Canal concept, would complete the destruction of migratory fishes. (Larry Trumbull, Sierra Club Member)

Response: As indicated in the response to the preceding comments, the Board takes no position in this plan on the Peripheral Canal.

Mr. Trumbull's comments have been forwarded to Fish and Game and the Department for their consideration in planning for and evaluating future Delta facilities. The Board will review and evaluate future additional project facilities on its own, but only after a decision or proposal has been made on what these facilities will be and how they are proposed to be operated.

Comment: We recommend that in Chapter VII of the plan you stipulate that the Department and Bureau complete modifications of their diversion facilities in the Delta by 1988. You should require that such modifications be designed to restore fish and wildlife to historical levels. We also recommend that you determine that the facilities should have the following capabilities:

1. To restore net downstream flows at all times in all Delta channels.
2. To provide for the water in the San Joaquin River upstream of the Mokelumne River, in Old River, and in Middle River to be primarily of San Joaquin River origin from September 1 through November 30.
3. To include a fish screen system capable of salvaging 95 percent of the fish more than 1- $\frac{1}{4}$ inches long. (Fish and Game)

Response: The Board will not require that the Bureau and the Department complete their diversion facilities. Such a requirement would essentially mandate the construction of the Peripheral Canal on which the Board takes no position. However, Chapter VII of the plan has been modified to indicate that if future facilities are constructed they should be designed to achieve the goals stated by Fish and Game.

III. AGRICULTURAL STANDARDS

A. Old River at Rancho del Rio and Victoria Canal at Middle River

Comment: Standards for Victoria Canal at Middle River and Old River at Rancho del Rio should be eliminated or modified, since salinity at these locations is frequently affected by highly saline drainage discharges and San Joaquin River flows. Salinity at these locations does not reflect solely the effects of salinity intrusion, and may at times be outside the control of project operations. If these standards are not eliminated they should be changed on the basis of assumed 1980 level without project water quality of the San Joaquin River at Vernalis. (Bureau, Department, KCWA, MWD, SLWD)

In dry and critical years the agricultural standards for Old River at Rancho del Rio and Victoria Canal at Middle River should be adjusted to provide better water quality than at San Andreas Landing. CDWA Exhibits P-1 through P-5 demonstrate that the maximum recorded salinity at Middle River was substantially less than that recorded at Central Landing in the dry and critical pre-project years 1924 and 1929 through 1934. (CDWA)

Records of East Contra Costa Irrigation District during the 1920s and 1930s (SRDWA Exhibit 62 in the hearing leading to Decision D 990) indicate that, except in very critical years such as 1924 and 1931, there was water of suitable quality for agricultural purposes until September or October. This refutes the Department's contention supporting revisions to the Rancho del Rio and Victoria Canal standards. (ECCID)

Response: There are substantial technical problems associated with the development of standards for Rancho del Rio and Victoria Canal stations in the south central Delta for the protection of interior Delta agricultural uses. The Department points out that without project water quality at Rancho del Rio and Victoria Canal would be influenced most of the time by the quality and flow of the San Joaquin River at Vernalis. Prior to any use of the assumed 1980 level

without project water quality at Vernalis as a basis of standards at these stations, the various factors influencing water quality in the interior Delta must be more thoroughly evaluated.

CDWA Exhibits P-1 through P-5 show the maximum recorded salinity at Central Landing and Middle River, but show neither the variation in salinity intrusion nor the dates of maximum intrusion at each station. The CDWA comments point out that there is insufficient data to make a complete analysis of historical water quality. We agree.

Finally, SRDWA Exhibit 62 shows maximum salinity intrusion at the ECCID intake, but gives no indication as to the rate of salinity intrusion in each year. This information neither refutes the modifications proposed by the Department nor supports any specific standards at these locations.

Agricultural uses in the interior Delta are also protected from the effects of seawater intrusion by other standards at Jersey Point and San Andreas Landing. Rancho del Rio and Victoria Canal stations were originally proposed to protect interior Delta agriculture in the event overland substitute supplies were provided western Delta users and standards at Jersey Point and San Andreas Landing were modified. Protection from land-based salinity and the effects of flow

problems of the San Joaquin River is tied to the approach to southern Delta standards, where the obligations of the SWP and CVP have not yet been determined. In view of this and the technical problems discussed above, the agricultural standards for Victoria Canal at Middle River and Old River at Rancho del Rio have been deleted from the Delta Plan. In its periodic review of standards, the Board will develop the necessary standards to provide specific protection for the interior Delta. In the meantime, the standards at Jersey Point and San Andreas Landing will provide suitable protection.

B. Southern Delta

Comment: The draft plan fails to protect southern Delta agriculture and fails to recognize or protect southern Delta water rights.

The draft plan fails as a water quality control plan for the following reasons: (1) There is no standard to protect the southern Delta until after New Melones Reservoir becomes operational at some indefinite time in the future; (2) the quality provided by the post-New Melones standard at Vernalis will not protect the southern Delta, and the record shows that a Vernalis standard which does not specify minimum downstream flows in the lower San Joaquin River is meaningless; (3) the proposed long-term standards will not adequately protect southern Delta agriculture; (4) the draft plan makes no effort to determine either the quantity or quality of the in-channel water supply needed to protect adequately agriculture, although the SDWA presented evidence in this regard; and (5) the draft plan fails to provide a program of implementation to achieve proper water quality standards.

The draft plan fails as a water right decision for the following reasons: (1) It does not set forth the quantity and quality of in-channel water supply needed to protect water rights; (2) the draft plan uses the concept of "reasonableness" to limit the historical crop diversity in the southern Delta; and (3) the draft plan has ignored SDWA testimony which shows post-project deterioration of the San Joaquin River water supply and the causes of that deterioration. Finally, the Directors of the SDWA recommend that the plan incorporate a recommended specific program to establish adequate and

suitable standards for the southern Delta, including semi-annual Board hearings to review negotiations with the Bureau and Department for southern Delta agricultural protection, and timely appropriate updates to interim standards as conditions warrant prior to implementation of long-term standards. (SDWA)

Response: Chapter V of the plan discusses the problems associated with development of implementable water quality standards for the southern Delta. The flows committed from New Melones Reservoir under a 1969 agreement between the Bureau and the Central Valley Regional Board should satisfy the Vernalis standard after the reservoir becomes operational. While the operational status of New Melones Reservoir is contingent upon hydrologic conditions over the next few years, it is anticipated that releases from New Melones Reservoir would be available to meet the Vernalis standard beginning as early as the 1979-80 water year. The Vernalis standard will not satisfy all needs, but will provide an interim level of protection prior to implementation of "full protection" standards.

The "full protection" standards will afford necessary water quality for protection of southern Delta agriculture. These standards are supported by testimony of the U.C. Cooperative Extension and the U.S. Salinity Laboratory. How these full protection standards substantially limit historical crop diversity in the southern Delta is not apparent from SDWA testimony or comments. The applicable standard for the April through August period is based on full yield for beans,

a relatively salt sensitive crop. While the information submitted by the South Delta Water Agency is helpful, it does not justify the establishment of higher protection levels than those contained in the standards for agricultural uses in the southern Delta.

Contrary to the SDWA contention, the Delta Plan does identify in-channel quality and indirectly the quantity needed to protect agriculture in the southern Delta. As indicated in the plan, the riparian rights would be sufficient generally to provide water quality for agricultural uses in the southern Delta. The "full protection" standards for the southern Delta when implemented would satisfy riparian rights.

The deterioration of the San Joaquin River water supply is discussed in Chapter V of the plan. The causes of this deterioration are uncertain. A contractual solution between southern Delta users and the Bureau and the Department appears to be the best course of action for resolving quality problems in the southern Delta. The program of implementation for the full protection standards makes provisions for a determination by the Board of the causes and responsibilities related to this water quality deterioration, if current negotiations between the project operator and the South Delta Water Agency fail to provide a solution.

Finally, the program recommended by the Directors of the SDWA for attainment of suitable protection for southern Delta agriculture is essentially that set forth in Chapter VII of the plan.

Comment: Control of salinity at southern Delta stations is beyond the capability of SWP facilities and therefore that control is not within SWP responsibility. (Department)

Response: The operations of the projects under the permits which are currently before the Board are in the Sacramento River Basin and their influence is generally indirect on most areas within the southern Delta. Therefore, a contractual settlement is the preferred course of action. In any event, the Board finds no sound basis to impose permit conditions on either project at this time toward meeting southern Delta standards. If contract negotiations among the South Delta Water Agency, the Department and the Bureau fail, then the Board action will be in accordance with the program of implementation discussed in Chapter VII of the plan.

C. Level of Protection

Comment: The agricultural water quality standards should be based on a full yield corn crop salinity tolerance of 1.9 EC. This would change the base agricultural standard for western and interior Delta stations from 0.45 EC to 0.50 EC. (Department, KCWA)

The threshold EC level for 100 percent yield of field corn on the Delta subirrigated organic soils should be revised from 0.45 mmho/cm to 0.35 mmho/cm, as supported by evidence in the record. The EC levels specified as standards in the draft plan will result in significant crop losses for many farmers in many years. (CDWA)

Response: Any attempt to establish overly precise EC tolerances for corn production in the Delta is impractical. Delta soils are not all identical, irrigation practices are not uniform, and rainfall conditions vary year to year, affecting leaching requirements. Therefore, use of a "middle ground" value supported by U. C. Cooperative Extension and U. S. Salinity Laboratory testimony is appropriate until better information is developed.

The only substantial basis stated for the value of 1.9 EC_e introduced by the Department and exporters was that it would save from 24,000 to 45,000 acre-feet per year. The Department claims that the U. C. Cooperative Extension evidence showed a range of from 1.7 EC_e to 2.1 EC_e . This is not the case. The U. C. Cooperative Extension did submit, at the request of some of the participants, an exhibit showing crop yields which would result from an EC_e from 1.7 to 2.1. The information was not submitted as recommendations for high and low values for EC_e in the Delta; rather it was submitted to illustrate only that different crop yields would result from different EC_e values. The U. C. Cooperative Extension indicated that the numbers used for threshold values in its exhibit are within a range of plus or minus 20 percent of actual requirements. To clarify the 1.7 EC_e , Chairman Bryson asked the U. C. Cooperative

Extension the following question at the hearing on May 30, 1978:

"The Department of Water Resources recommends that agricultural water quality standards be based on a full yield corn crop tolerance of 1.9 EC soil salinity rather than 1.7 EC. We use the 1.7 and I believe based on our interpretation of some of the material you presented. Do you have any observations on that?"

Dr. Hoffman from the U. S. Salinity Laboratory replied to the question:

"Well, if you will return to the record, you will notice several studies in which I mention where the data came from, and at that time I also showed you several research studies which have not been published, one of which was at Davis. I think in all there are five different studies, all on mineral soils and none on organic soils, and I wouldn't want to draw the line for salt tolerance any differently now than what we did then with that data." (RT Vol. XXXVI, p. 82-83.)

The value of 1.7 EC_e used for the salinity threshold tolerance of corn came from experiments done on mineral soils. However, the results of these experiments are the only published data available. An adjustment from mineral soils to organic soils is shown in the mathematical formulas described in the EIR (pp. III-131 to III-133).

A concern expressed by KCWA was that the 1.7 EC_e determination was not based on a best fit analysis of all the test data.

During the hearing Dr. Hoffman explained that 1.7 EC_e resulted from using experimental data which could be considered appropriate for determining the salt tolerance of corn. Dr. Hoffman showed

(U. C. Exhibit II-10) that the yield decrement curve from the statistical linear regression analysis done with the published data did not fit all of the data points of the unpublished data, and this would be expected since the unpublished data was not used in the development of the regression line. The rationale for using only the published data is explained in Dr. Hoffman's testimony.

Comment: The EC levels specified as standards in the draft plan will result in significant crop losses for many farmers in many years. (CDWA)

The proposed standards will not adequately meet the needs of farmers. (LWV)

Response: The determination of 0.45 EC_w water to produce a 100 percent yield of corn on the subirrigated organic soils in the Delta was accomplished by utilizing U. C. Cooperative Extension exhibits and testimony. If the salinity levels in the soil profile prior to germination of the corn are too severe, a yield decrement could occur. However, adequate information relating salinity levels prior to the growing season to crop yield were not provided in the hearing. It is assumed that with best management practices, such as winter leaching, the organic soils can produce corn crops without a yield decrement if water quality of 0.45 EC_w is provided during the growing season.

As pointed out in Central Delta Water Agency comments, the U. C. Cooperative Extension testimony and exhibits indicate

that there is a range in the increase of salinity concentration as the irrigation water becomes soil water. U. C. Cooperative Extension suggested that the range of this increase in salinity concentration was from 5 to 10 times. Therefore, an average value of 7.5 was used to represent the concentration factor as applied water becomes soil water which the plants use in the subirrigated organic soils in the central Delta. The Central Delta Water Agency makes reference in their comments to U. C. Exhibit 7 which shows wide variations in this salinity concentration factor. However, this exhibit is concerned with lands in the South Delta Water Agency which are composed mainly of mineral soils, and thus has no direct applicability to the organic soils in the central Delta.

Although other crops more salt sensitive than corn are grown in the Delta organic soils, corn by far occupies the largest acreage. Corn was selected as the crop on which to base the standard because it is believed to be the most salt sensitive crop of major economic importance in the Delta organic soils.

Comment: Under without project conditions in dry and critical years Sherman and Jersey Islands could not grow corn profitably. Therefore, the agricultural standards for Enmaton and Jersey Point either should be relaxed in dry and critical years to protect more salt-tolerant crops, or should be moved further upstream. (Bureau)

Response: The critical year standards are not based on protection of any specific crop; rather, they are based on average without

project salinity conditions, as limited by reasonable use, in critical years in the period April 1 through August 15. However, evidence presented at the hearing by the U. C. Cooperative Extension and the U. S. Salinity Laboratory does not indicate conclusively that corn could not be grown profitably in dry and critical years on Sherman and Jersey Islands. In fact, during the critical year of 1977 some growers on Sherman Island chose to grow corn. This indicates that corn may be grown profitably under these conditions. Therefore, we believe the standard is correctly set for dry and critical years. If contracts are negotiated with landowners on these islands to modify their needs in dry and critical years, changes to the standards will be considered at that time.

Comment: Delta agricultural standards should be based on prediction of without project irrigation season water supply, not on predicted annual unimpaired runoff. (Bureau)

Response: The predictions of unimpaired runoff by the Snow Surveys Branch of the Department are fair and impartial, and have a high degree of credibility. While the Bureau's proposed method would use predicted unimpaired runoff as a base, it would introduce into the year type classification the summer use patterns by nonproject water users (e.g., rice growers and hydroelectric power facilities), whose actual use patterns might vary from the Bureau's assumptions by a significant amount. For example, the CVP and SWP operators observed significant

unpredicted changes in nonproject water use patterns in 1977. Also, unseasonably cool weather in 1978 delayed the snowpack runoff. Other factors may add to the uncertainty of April 1 through August 15 predicted without project water supply.

Comment: The draft plan allows the SWP and CVP to degrade water quality in the Delta substantially. Proposed agricultural standards should be changed to require maintenance of good quality water in those months when good quality would have existed historically, and to upgrade quality to protect all beneficial uses in months of poor water quality historically. (CDWA)

A relaxed agricultural water quality standard should be applied in dry years which follow dry or critical years (such as 1930 and 1932), on the basis of detrimental impacts on project yield caused by proposed standards. Agricultural water quality standards should be relaxed in those dry years when other water users in the state are taking deficiencies in their water supplies. (KCWA)

Agricultural standards should be relaxed in dry years when SWP water service contractors are taking deficiencies in their firm water entitlement deliveries. (MWD)

Response: The agricultural standards are based on 1980 level without project quality, not on historical quality. This assures that the projects will not infringe on Delta vested water rights, but does not impose on the projects the burden of restoring water quality to the extent it deteriorates as a result of upstream diversions by riparians and nonproject appropriators. The proposal in CDWA's comment would constitute enhancement to Delta agricultural users. Provision of such enhancement is a matter for negotiations between the Delta users and the project operators.

Likewise, it would be contrary to established water right principles and provisions of the Delta Protection Act for the Board to adopt standards which would ignore vested rights, and tie Delta agricultural protection to deficiencies applied to export beneficiaries. Finally, Department operation studies do not show the application of deficiencies in firm entitlement in any dry year, including 1930 or 1932 of the seven-year critical period.

Comment: The Department has studied some of the impacts of the emergency water supply to Sherman Island during 1977. Several landowners who were irrigating with poor quality water (never better than about 2.0 EC) from the Three Mile Slough area obtained yields of 4.0 tons per acre of corn which is equal to yields in normal years. This justifies relaxing the Board's assumed level of maximum salinity tolerance for corn production in the Delta. (KCWA)

Response: Comments by the North Delta Water Agency indicate that corn crop yields on Sherman Island (Reclamation District No. 341) were considerably lower than indicated by KCWA. For those areas with sufficient production to justify harvesting, the average yield was 2.0 tons per acre. The maximum reported yield from any field was 2.5 tons per acre. The Board's review of the limited water quality measurements taken in 1977 indicates that the salinity data are insufficient to draw firm conclusions concerning salinity tolerance for corn production in the Delta. Future changes in Delta agricultural standards must be supported by careful research and sound technical data.

Comment: The agricultural section of the EIR should be rewritten because of misunderstanding of U. C. Cooperative Extension testimony. (KCWA)

Response: The discussion in the EIR regarding Delta organic soils and related water quality needs are derived from U. C. Cooperative Extension testimony. The EIR does not assert that actual in-field applications of irrigation waters with certain salinity values would give yield results identical to those shown by equation 5 on page III-133 of the EIR. In any single growing season one could apply an average water quality and the yield decrements could be different from those computed from the mathematical relationship shown in the EIR. Testimony from U. C. Cooperative Extension put a range of plus or minus 20 percent on the accuracy of the EC_e values and corresponding crop yield used in their own guidelines. With a range that great, prediction of exact yield decrements for any one year would be impossible. The treatment in the EIR of yield decrements resulting from water of varying salinities is based on testimony presented by various parties during the evidentiary hearing. During the May 28, 1978, hearing on the draft plan and the Draft EIR, a representative of U. C. Cooperative Extension was asked if he found the interpretation in the draft plan of the data presented by the U. C. Cooperative Extension to be satisfactory. His reply was "It's as we presented, as good or as bad as it is" (RT Vol. XXXVI, p. 82). From this, we conclude that there is not a misunderstanding of the testimony presented by the U. C. Cooperative Extension. The EIR recognizes the difficulty of

applying research data obtained in mineral soils to Delta organic soils. The EIR also states that certain logical assumptions had to be made and that further research may alter some of these assumptions.

Comment: Since corn does not receive any irrigation during April, that month should be deleted as a month when higher water quality for irrigation of corn must be provided. (KCWA)

Response: The irrigation season used in the Delta Plan is not tied directly to corn but instead is established to provide protection to other irrigated crops as well. The unrefuted testimony of North Delta Water Agency states that the irrigation season is from the middle of March to the first part of September (RT Vol. XV, p. 76). This and other testimony indicates that most of the irrigation season occurs from April 1 to August 15.

Comment: The draft plan purports to protect agricultural water use only for certain types of crops, thereby imposing a defacto limit on agricultural use by vested right holders. (CDWA)

Response: The plan recognizes the indefinite nature of riparian rights, as limited by reasonable use. The Board determined that it was reasonable to base agricultural standards on the salinity tolerance of the most salt sensitive crop of significant importance currently grown. Selection of this principal crop will provide adequate quality to assure protection to most other crops currently being grown in the Delta, as limited by without.

project conditions. Protection of a highly salt sensitive crop of small acreage and economic importance in the western Delta in any but the wettest years would be an unreasonable use of water. The Board will continue to consider the current needs of Delta agriculture resulting from any changes in cropping patterns.

Comment: The basic methodology of the draft plan is to decrease greatly the protection of western Delta agriculture. The "protective parameters" established for wet years have been greatly relaxed for dry and critical years. For the standards at Jersey Point and Emmaton, the draft plan would reduce water quality protection in critical years by 770 percent and 900 percent, respectively, as compared to protection proposed for a wet year. (CCCWA)

Response: The Delta Plan's standards for the western Delta are based on agricultural needs as limited by vested water rights. This matter is discussed extensively in the plan, the EIR, and this Appendix. Relaxations in agricultural standards in the western Delta are based on the quality that would exist today in the absence of the SWP and CVP. Provision of better water quality expressly for agricultural use constitutes enhancement, and is a matter for negotiation between agricultural interests and project operators as provided for in law.

D. Protection Outside the April 1 to August 15 Irrigation Season

Comment: The draft plan allows the SWP and CVP to degrade substantially the quality of agricultural water supplies in the Delta in most months of most years. Water quality protection is

needed outside the April 1 to August 15 irrigation season specified in the draft plan. (NDWA, CDWA, ECCID)

Response: The basic approach used in the development of agricultural standards is to protect such uses over the major portion of the irrigation season (April 1 to August 15). Testimony presented during the evidentiary hearing of this proceeding indicated a need by agriculture for water outside of the April 1 to August 15 irrigation season. However, with the exception of the southern Delta for which standards have been developed for the period outside the major irrigation season, no substantial evidence was submitted regarding the level of water quality needed outside the irrigation season. Without quantifiable information as to these water quality needs establishment of reasonable standards is not possible. The needs of agriculture outside the major irrigation season will be given further consideration by the Board in its periodic review of standards. However, it should be noted that standards for other uses and carriage water requirements of the projects provide salinity protection for agriculture beyond the August 15 date.

E. Year Classification

Comment: A subnormal snowmelt provision should be contained in all water quality standards. (Department, MWD)

Response: This proposal is a proper matter for future Board consideration and should be evaluated then along with other potential refinements to the standards.

Comment: The "Year Following Critical Year" designations should be deleted from Delta agricultural standards. (CDWA)

Response: The year classification system has been modified by eliminating the "Year Following Critical Year" designation for agricultural, municipal and industrial standards, to provide those uses the full protection to which they are entitled under their vested water rights.

The specific effect of this modification will be to reduce exportable yield of the project by about 15,000 acre-feet. However, other modifications discussed in the appendix would have an effect on exportable yield. The net effect of these modifications (both increases and reductions) is discussed in Chapter 5 of the EIR.

Comment: The hydrologic year classification system set forth in the draft plan has little, if any, relevance to the southern Delta, which is primarily influenced by inflow from the San Joaquin River. (SDWA)

Response: The plan recognizes that Sacramento River Basin hydrology is not a primary factor in determining water quality conditions in the southern Delta. Furthermore, riparian rights would generally entitle these users to suitable water quality for agricultural uses during all hydrologic year types. In view of this, the standards for the southern Delta are not affected by the hydrologic year type of the year classification system.

F. Future Studies

Comment: MWD intends to assist in the additional studies needed to develop a more precise methodology and data base for setting reasonable salinity criteria for subirrigated Delta agriculture. MWD also recommends studies applying the yield concept to individual farms, as well as studies concerning crop market flexibility, the impact of winter leaching, and the duration of the irrigation season. (MWD, KCWA)

Response: Additional data needs to be developed for the subirrigated lands in the Delta. Research to develop this information should be performed by the U. S. Salinity Lab and U. C. Cooperative Extension. Such research concerning organic soils should be initiated by the next irrigation season including correlation of EC_w to EC_e , determination of the threshold tolerance of corn, and determination of the yield of corn in relation to EC_w and EC_e . Additional studies would include determination of the quality of water necessary outside the irrigation season for leaching and determination of crop sensitivity to salinity throughout the growing season. The Board will take the lead in cooperation with affected hearing participants to initiate the necessary studies.

Other studies which MWD recommends, such as the application of the yield concept to separate farms and crop market flexibility, would be so detailed and variable that we do not see how they would be useful for future revisions of the agricultural standards.

G. Surplus Water

Comment: CDWA Exhibit "S" included with the CDWA comments on the draft plan at the hearing, is a plot of San Andreas Landing - Central Landing salinity concentrations during August against annual Sacramento Valley unimpaired runoff. This graph shows that August salinity concentrations exceed the 0.20 mmho/cm EC needed for protection of carrots and beans, whenever unimpaired annual runoff is less than 13 million acre-feet (or 0.35 mmho/cm EC and 11 million acre-feet, if corn is used). Therefore, there is no water surplus to current agricultural uses in the central Delta area in any year in which Sacramento Valley unimpaired runoff for the water year is less than 13 million acre-feet. For that reason, no diversion of natural flow by junior appropriators should be allowed in dry and critical years. (CDWA)

Response: This comment presumes that no surplus flows are available at any time during a year when water quality is inadequate for crop production in the month of August. CDWA Exhibit "A" probably demonstrates that no surplus flows exist in August of some years, but not that surplus flows are unavailable during the winter and spring of such years. CDWA has not demonstrated that exports during months of high Delta outflow bear any relationship to August salinity conditions in the central portion of the Delta.

IV. MUNICIPAL AND INDUSTRIAL STANDARDS

A. Contra Costa Canal M&I Standards

Comment: The Board has properly found that the Contra Costa Canal provides a substitute water supply for the Antioch area. However, the Board should modify the standard to allow compliance to be measured both at the Contra Costa Canal Intake (Pumping Plant No. 1) and at Antioch. (Department, MWD)

Response: The Contra Costa Canal standard has been modified to allow compliance at either Pumping Plant No. 1 or Antioch, since vested rights of the water users would be satisfied equally in either case.

Comment: The Board should seek a remedy to the agricultural return flows which currently degrade water quality in the vicinity of the Contra Costa Canal Intake. (Department, MWD)

Response: The problem of agricultural return flows in the Rock Slough area is addressed in Chapter VII of the plan. As stated there, the Board, under Section 208 of the Federal Water Pollution Control Act, is evaluating the effects of agricultural return flow on water quality. In conjunction with the Central Valley Regional Board, the Board will develop appropriate management practices and take prompt action to reduce detrimental effects of these return flows.

Comment: Neither the draft plan nor the Draft EIR presents an analysis of the CVP capability to furnish a municipal and industrial supply of adequate quality to the Contra Costa Canal. Neither document states justification for the degradation allowed by the draft M&I standards. The Board has ignored the provisions in the District's contract with the Bureau "...to maintain the quality of the raw water to be delivered hereunder at the highest level reasonably attainable and consistent with M&I use." (CCCWD)

Response: The standards in the Delta Plan allow the projects to provide a substitute supply at the Contra Costa Canal Intake to water users in the vicinity of Antioch, in lieu of that which would be required to satisfy vested rights offshore of Antioch. This is based on the Board's determination that the provision of such substitute supplies would be in the best public interest, considering the substantial quantity of water that would otherwise be required as Delta outflow to meet vested rights offshore of Antioch.

The Contra Costa Canal presently provides an adequate substitute supply to Antioch water users. The Bureau has not indicated any lack of CVP capability in meeting the Contra Costa Canal Intake standard (the Bureau's comment on the reasonableness of the standard is discussed below).

The District's comment on "adequate quality" appears directed more toward provisions in the District's contract with the Bureau than toward vested rights. This contractual arrangement and any negotiations for enhancement are matters entirely between these two agencies.

B. 250 mg/l Chloride at Rock Slough

Comment: The maximum chloride concentration of 250 mg/l allowed at the Contra Costa Canal Intake would not have been available at Antioch a good portion of every year under without project

conditions. Thus, the standard constitutes some degree of enhancement, and deviates from the Board's application of the concept of mitigation. Consequently, this quality should not be provided without payment by the users to the water projects. (Bureau, MWD, SLWD)

Response: The maximum chloride concentration of 250 mg/l at the Contra Costa Canal Intake is derived on the basis of EPA Drinking Water Regulations pursuant to Public Law 93-523, and drinking water standards for community systems contained in Section 64473 of Title 22 of the California Administrative Code. The EIR (Chapter III), the plan (Chapters V and VI) and Section 64473 indicate that exceedence of this limit may be objectionable to an appreciable number of people, although not generally hazardous to health. The Board has determined on the basis of public interest that this level of protection is necessary to ensure that water supplies for human consumption are potable and do not endanger human lives or health. Payment for enhancement is a matter to be resolved by the project operators and those users benefited, as provided in the Delta Protection Act. There are appropriate legal actions available if there is a reluctance by any of the parties to settle the matter by negotiation.

Comment: The Draft EIR fails to analyze the impact of the Contra Costa Canal Intake standards on human health, and on the cultivation and growth of agricultural and landscape plants. While the draft plan refers to the 250 mg/l chloride public health standard established by EPA, it does not discuss the impact of that standard on that portion of the population which, for health reasons, requires lower levels of chloride in its water. Neither has the draft plan discussed the impact of high chloride levels on plants used for landscaping and other purposes by the general public. (CZ)

Response: A general discussion on these impacts has been added in Chapter V of the Final EIR.

C. Contra Costa Canal - Industrial Standard

Comment: There appears to be no logical basis for requiring the Contra Costa Canal 150 mg/l standard to be met in intervals of at least two weeks' duration. Also, the requirement would be unreasonable if fluctuations caused by local drainage, high winds or other occurrences caused the quality at Pumping Plant No. 1 to temporarily exceed 150 mg/l and negated compliance during the preceding or subsequent 13 days. (Department, MWD)

With regard to the substitute supply to users in the vicinity of Antioch, the SWP and CVP could allow wide variations in chlorinity at Contra Costa Canal Intake, with which the salt-sensitive industries cannot cope. (CCCWD)

Response: The two-week durational requirement is necessary to meet industrial needs by protecting the users from significant variations in water quality that could preclude meeting their needs. The durational requirement also is consistent with rights of the water users as historically exercised offshore of Antioch. It is this entitlement which the water projects are committed to provide through a substitute supply. Although the requirement was included in the narrative of the draft plan, it was inadvertently omitted from the description of standards in Table VI-1. The table has been corrected to include this requirement.

Comment: The 150 mg/l chloride standard for industrial use in the Contra Costa Canal service area is a realistic objective, but the use of CVP and SWP yield to maintain this standard by increasing Delta outflow is not reasonable. Maintenance of this standard will require an increase in Delta outflow of 300,000-400,000 acre-feet per year over carriage water (outflow required to maintain suitable water quality at the project export pumps in the southern Delta) necessary to meet Bureau export needs. (Bureau)

Response: If the projects had been required to meet the 150 mg/l chloride standard offshore at Antioch, which would have been the case but for the Board's determination on the availability of a substitute supply, the impact on combined exportable project yield would have been almost one million acre-feet. Thus, meeting the standard at the Contra Costa Canal Intake rather than at Antioch substantially decreases required outflow.

The "increase" in outflow asserted by the Bureau was obtained by using carriage water outflows as the base from which to measure impacts of standards on project yield. The use of carriage water requirements as a base case is not realistic since it would infringe on vested water rights in the vicinity of Antioch.

Comment: The draft plan neither protects Crown Zellerbach's beneficial use of water nor recognizes Crown's right to such water. Evidence presented during Phase I of the evidentiary hearing clearly established that 150 mg/l chloride or less has been available to Crown virtually 100% of the time. We recommend that a 150 mg/l chloride standard for the Contra Costa Canal and offshore at Antioch be adopted on the basis of this historical supply, such that the Canal and San Joaquin River supplies will combine to meet Crown and Fibreboard's needs for a minimum of 339 days in every year (93% of the year). Crown's position is that it has a legal right to water of 150 mg/l or less chloride virtually the entire year, with such water quality to be available from offshore its mill a specific period of time, and from the Contra Costa Canal pursuant to Crown's right under the Delta Protection Act during substantially the remainder of the year. (CZ)

Fibreboard's right to water of adequate quality is not limited to its riparian right, and extends to the right as a Delta water user through the Contra Costa Canal to protection of water quality at Rock Slough. The draft plan would reduce the number of days each year that water of adequate quality is available to Fibreboard from either the San Joaquin River or the Contra Costa Canal. The historical average of such availability is 353 days per year (97% of the year). That without project conditions would be worse than pre-project conditions in terms of the availability of good quality water at Antioch simply has not been established on this record. (Fibreboard).

The City of Antioch strongly objects to the adoption of the proposed plan, construction of any facility or any other alternative that decreases the historical water quality offshore at the City of Antioch. (Antioch)

Salinity levels under proposed standards will not be low enough so that industry can use the water beneficially. (LWV)

Response: The standards of the Delta Plan provide diverters from the San Joaquin River near Antioch, including Crown and Fibreboard, with a substitute supply through the Contra Costa Canal. Under these standards, municipal drinking water supplies are protected to public health standards, and industrial users in the vicinity of Antioch are assured that their vested water right will not be encroached on by the projects. Recent historical water quality (1945 to 1967) of the San Joaquin River at Antioch has been enhanced by outflow conditions resulting from project releases of excess water which was available prior to buildup of CVP and SWP demands. As anticipated, the benefits of project operations have decreased and will continue to be reduced in the future. The senior water rights of these industries do not entitle them to flows which are in excess of natural flow conditions in the Delta. In view of the artificial nature of recent historical flows, the industries are not entitled to such flows under their vested rights.

Crown and Fibreboard's entitlement to water quality and quantity from the Contra Costa Canal, beyond their vested rights, are determined by water service contracts which are outside the Board's jurisdiction. However, in accordance with the Delta Protection Act, if Delta industries desire additional benefits, they can seek such benefits from the project operators.

We question the detailed rationale supporting Fibreboard's contention that the plan does not establish that without project conditions would be worse than pre-project conditions. Fibreboard in its detailed comments uses the location of maximum salinity intrusion (as indicated by the 1000 ppm chloride line), both pre- and post-project, to argue that the Board has wrongly concluded that the projects have extended the availability of 150 mg/l chloride water at Antioch. We believe this simplistic analysis by Fibreboard cannot be considered to represent a valid comparison between without project and pre-project conditions.

Comment: The standards in the draft plan would cause Crown to suffer substantial economic damage, potentially threaten the economic viability of its paper manufacturing operation and threaten its recycling of waste paper. These adverse impacts would result from elimination of the Antioch M & I standard (forcing Crown to purchase all of its process needs from the Contra Costa Canal) and establishment of a chloride standard at the Contra Costa Canal Intake that would assure Crown suitable quality water only a little over 50 percent of the year compared to the virtual 100 percent historic availability. The Draft EIR vaguely talks of incidental composite protection which would come much closer than the standards themselves to meeting Crown's reasonable beneficial uses. Such composite protection is neither guaranteed or mentioned by the plan, and would be substantially reduced should the Peripheral Canal be constructed. Finally, the Draft EIR fails to analyze the potential impact of 150,000 tons per year of waste paper returning to the nation's stream of solid waste and the resultant problem associated with disposal. (CZ)

The Contra Costa County Water District introduced evidence of economic impacts of variations in the quality of municipal water, such as user penalty costs, interference with water treatment processes, reduced reclamation potential, etc. The draft plan ignores this evidence and the Draft EIR is completely silent on the subject. (CCCWD)

Response: The Delta Plan standards could potentially cause some economic impact to Crown and Fibreboard as compared to either the Basin 5B Plan standards or actual water quality experienced by

these industries in recent years. However, the potential impact of the Delta standards under varying hydrologic conditions cannot be quantified, since no long-range predictive methods have been developed correlating Delta salinity with water quality conditions at Rock Slough. The Board staff has worked with the Contra Costa County Water District staff in an effort to refine current predictive methods, with little success. Furthermore, there is insufficient information available, even considering CCCWD Exhibit 17 and supporting testimony, to determine adequately the economic impacts in the Contra Costa Canal service area of varying salinity levels.

However, in most years, the combined effects of the standards (including overlap or umbrella effect of all standards), project carriage water and uncontrolled flows would provide better quality water than that provided by the individual standards. This composite protection is not assured by the plan, but like historical water quality will likely occur. Thus, this composite protection is considered in the analysis of impacts of the standards. If industrial users want to be assured of this protection or any other reasonable level of protection, they can obtain the necessary supplemental supplies to ensure the continued availability of suitable water quality to satisfy their needs.

The Delta Plan is not dependent on the construction of any additional project facilities. Also, no additional project facilities are expected to be completed during the effective period of this plan. Thus, the impacts of the Peripheral Canal or any other proposed future facilities are not applicable to this plan.

Impacts related to return of a portion or all of Crown's waste paper raw material back to the normal process of solid waste disposal are not known. However, we note that Crown continued to produce salt sensitive paper products from waste paper during the drought year of 1977, when chloride concentration of the mill's water supply from the Contra Costa Canal substantially exceeded 150 mg/l all year. While the additional costs incurred in 1977 are not known, Crown Zellerbach's testimony in Phase II of the hearing was that mill production costs would increase by about \$200,000 per year if the water supply were 250 mg/l chloride all of the time as compared with a year-round quality of 150 mg/l chloride (RT Vol. XXX, p. 93).

Comment: The draft plan drops the Antioch M & I standard based on an improper determination by the Board that an adequate substitute supply exists for users of water from the San Joaquin River near Antioch. (Fibreboard)

The Board has misapplied the substitute supply rule found at Section 12202 of the Delta Protection Act. Crown has no guarantee or showing in the record that the Contra Costa Canal has the capacity to meet substitute supply needs, that a

capability exists to meet all industrial water quality needs, and that water will be delivered without added financial burden to Crown. The Antioch M & I standard should remain in effect until all elements of the Delta Protection Act have been met. (CZ)

There is a serious question about the absence of a municipal and industrial water quality standard at Antioch, since many of the industries along the shoreline have water rights. (CCCWA)

Response: The record supports a finding that a substitute supply is physically available from the Contra Costa Canal to Delta users in the vicinity of Antioch. The testimony of Mr. Ronald B. Robie, Director of the Department of Water Resources (RT Vol. II, p. 56, 57) is: "As a result of recent increases in the Contra Costa County Water District contract with the Bureau, I believe that adequate substitute supplies exist for all the industrial and municipal water users in the vicinity of Antioch and Pittsburg and that the Antioch standards are no longer applicable. All of the uses in the area now have either direct or indirect access to the Contra Costa Canal and the Department has offered to pay the increased costs of taking water from the canal as a result of reduced availability of suitable offshore water supplies due to State Water Project operations." The contractual arrangements under which such substitute supplies will be provided is a matter between the affected users and the project operators. The Department is bound by the requirements of the Delta Protection Act. Therefore, if an equitable agreement cannot be reached, the parties have legal remedies available to them. Consequently, the Board's finding of a substitute supply in accordance with the Delta Protection Act is justified.

Comment: The draft plan utilizes and relies on the concept of mitigation of SWP and CVP effects rather than provision for and enforcement of protection of reasonable beneficial uses in the Delta. The Water Code makes very clear that reasonable beneficial uses in the Delta come first and are to be protected by water quality standards drafted by the Board. (Fibreboard)

The Delta Protection Act goes beyond the general law and is intended to protect all beneficial uses without limiting protection to vested rights. The Board has applied an erroneous legal standard in defining the scope of protection guaranteed Delta users by the Delta Protection Act. The draft plan will not protect Crown's reasonable beneficial use of water in the production of paper as mandated by the Delta Protection Act. Standards should be established on full protection of all beneficial uses. (CZ)

Response: The Water Code provides for the establishment of water quality standards for the reasonable protection of beneficial uses and does not (as inferred above) require full protection of all reasonable beneficial uses. The Legislature, in directing focus on the reasonableness of the level of protection, recognized that the State's water resources are limited. Because of this, the Legislature has delegated to the Board the discretionary authority to identify the reasonable levels of protection to be provided to beneficial uses based on a consideration of vested water rights and public interest concerns.

We concur that the Delta Protection Act (Water Code Sections 12200-12220) does go beyond the general law and is intended to provide water users in the Delta benefits beyond their vested water rights, provided they pay for those benefits. Certainly, this act provides that the State Water Project must be operated so that prior vested water rights are not infringed upon. But this is nothing more than a recitation of the general law.

The important provision of the Delta Protection Act is its guarantee to Delta water users of the opportunity to obtain enhanced water quality beyond their vested water rights. The effect of this provision is to give first priority to satisfying these requests for enhanced quality in the Delta and to relegate to second priority all exports of water from the Delta. However, the Department is not required to provide Delta water users enhanced quality in excess of their vested rights without adequate compensation.

If Delta water users desire additional benefits in excess of their vested rights, they can seek such benefits from the project operators.

D. Cache Slough

Comment: The proposed standards at Cache Slough are beyond SWP control. Therefore their maintenance is not the responsibility of the SWP. (Department)

Response: The Cache Slough standard is based on public interest concerns to protect public drinking supplies to public health levels, as defined in state and federal law. Maintenance of this standard is within the capabilities of the SWP and CVP since violation of the standard would generally occur only under conditions of substantial salinity intrusion, which can be controlled only by project operations. Therefore, inclusion of this standard in SWP and CVP water right permit terms and conditions is appropriate.

E. Future Studies

Comment: The Board should undertake studies to determine the extent to which the Contra Costa Canal supply enhances the Antioch area water supply over the supply the area would receive in the absence of the SWP. (MWD)

Response: The Board will continue to review and refine standards in the future, as additional information becomes available.

However, any enhancement provided to Contra Costa Canal water users and payment associated with such enhancement is a subject of negotiation between those users and the projects.

V. FISH AND WILDLIFE STANDARDS

A. General

Comment: The fish and wildlife standards should be designed so that modification can be made easily as knowledge increases of the relationships among fish, water quality, exports and flow. For instance, one suggestion is that recommendations made by the Four-Agency group, Department, Bureau, USFWS and Fish and Game, be incorporated automatically as standards. (Department, MWD)

Response: Groups other than those agencies participating in the Interagency Ecological Study Program have expressed concerns about fish and wildlife standards. In changing any standards the Board must consider information submitted in a public forum by all interested parties. Any changes in conditions of the SWP and CVP water right permits which are the subject of this proceeding must be made in accordance with water right procedures, which also include a public hearing. In other words, we can see no "easy" way to modify Fish and Wildlife standards consistent with statutory safeguards to ensure public participation. However, the Board has set the direction for possible future modifications of the standards. Suggestions for changes by all affected parties will be evaluated against this general direction and desirable modifications will be accomplished as expeditiously as possible.

Comment: The beneficial use section of the plan leaves an impression that wildlife in the project service areas has benefited substantially. We agree that considerable fishery

benefits have been created in project reservoirs and aqueducts; however, these benefits should be balanced against major detriments to the fishery in the San Joaquin River and substantial detriments to wildlife in the San Joaquin Valley and Southern California service areas related to loss of habitat caused by expanded agricultural development. Preservation measures to offset wildlife losses are still an unresolved issue in the latter case. (Fish and Game)

Response: The Board is aware of Fish and Game's concern; however, the beneficial use section of the plan is simply stating the beneficial uses that are made of Delta water. The possible adverse impacts to wildlife that have occurred in the project service area due to changes in land use, while important, are not beneficial uses of Delta waters, and thus not a proper topic for inclusion in this discussion.

Comment: The draft plan does not contain the entire position set forth in Fish and Game Exhibit 11 explaining the judgment of Fish and Game that restoration of fish and wildlife to historical levels in the immediate future is unrealistic. Fish and Game's position is that such restoration is prevented by both present CVP-SWP facilities in the Delta and current export levels, rather than just by the former, as the draft plan states. (Fish and Game)

Response: The EIR illustrates that in order to approach historical levels of protection with present CVP and SWP facilities it would require at least one-half of the exportable yield of the projects. Therefore, the Board does not consider the attainment of this level of protection of fish and wildlife to be in the public interest at this time. The passage referred to by Fish and Game (draft plan pp. VI-1,2) has been corrected to reflect their comment.

Comment: Fish and Game is pleased that the Board has recognized the appropriateness of maintaining fish and wildlife resources at recent historical levels. The Board should make the finding that protection to such levels is in the public interest and that in the long run the Board expects to evaluate objectives based on achieving historical levels. (Fish and Game)

Response: Chapter VI of the draft plan contained a discussion to this effect. This discussion has been moved to Chapter VII of the Delta Plan as major policy guidance to all parties.

Comment: There is some misunderstanding of the term "historical levels" used in the draft plan. The aspect most misunderstood is the qualification presented in Fish and Game Exhibit 11 for species spending part of their life in the estuary, but having their abundance controlled principally by conditions outside the estuary. In such cases, the obligation is to maintain estuarine conditions sufficient for the species while they are using the estuary. (Fish and Game)

Response: This aspect has been clarified in Chapter VII of the Delta Plan.

Comment: The Delta Plan should utilize 1977 data analysis relative to fish and wildlife resource needs since 1977 appears to have been the type of water year when the system simply "falls apart". The 1976 and 1977 data, as well as that of the succeeding 3 or 4 years, will really tell the story as to the impact of the drought. The Board should be ready to take this future analysis into consideration as soon as it is available. (USFWS)

Response: The 1976 and 1977 ecological data available to us have been evaluated in both the plan and EIR. The Board will consider this and all additional ecological information when reviewing standards for the protection of fish and wildlife.

Comment: The Four-Agency Agreement proposed as the basis for establishing the needs for fish and wildlife was negotiated for a different purpose than that for which the Board is using it. The Board's purpose is to preserve fish and wildlife beneficial uses. Therefore, the question the Board is asking is, "What is needed to preserve fish and wildlife?" The Four-Agency Agreement responds to an entirely different question. The agreement was negotiated with the assumption there would be adverse effects on fish and wildlife habitat, but given those adverse effects, a mechanism would be implemented to alleviate them. Therefore, use of the agreement to establish fish and wildlife needs for the next 10 years ensures that fish and wildlife will not be maintained at their current level, but at a degraded level resulting from the effects of water developments. The basic concerns USFWS has with the draft plan are very similar, if not identical, to those it has with the Four-Agency Agreement in its present form. Therefore, USFWS will continue to emphasize the necessity for an agreement that adequately addresses the needs of fish and wildlife rather than one which falls well short of that objective. (USFWS)

Response: This comment strikes at the heart of the problem facing the Board. Preservation of the fishery at recent historical levels is an appropriate goal to strive for, and both the draft plan in Chapter VI and the Delta Plan in Chapter VII emphasize this point. The problem comes in achieving this level of protection consistent with the public interest. Alternative IIIA of the EIR evaluates the potential impacts of trying to implement this goal with present project facilities. The impacts on project yield (an approximate 50 percent reduction in 1980 exportable yield) is not considered by the Board to be in the best public interest, particularly when possible alternative measures can be taken to attain this level of protection. Specifically, these include protection of Suisun Marsh by means other than solely with

outflow and provision in the plan that if additional facilities are constructed they must provide protection of the fishery at recent historical levels. The Board and USFWS have the same goals; our differences concern only the mechanisms and time frames necessary to achieve these goals. The Board believes that such goals will be achieved only through the development of realistic and implementable programs.

Comment: Water development in California has proceeded under the mistaken assumption that in the natural systems surplus water is available that can be diverted for other uses without adversely affecting those natural systems. The draft plan would reduce the flows available for fish and wildlife even further. The current state-of-the-art of instream flow methodology tells us that to reduce flows further would have an even more serious adverse impact on fish populations. There are presently no surplus supplies of water from a fish and wildlife beneficial use point of view in this system. USFWS therefore calls for a moratorium on further diversions of water out of the system until the needs of fish and wildlife beneficial uses within the system have been provided. (USFWS)

Response: When considering water available for appropriation, the Board is required to condition permits relative to the reasonable needs of fish and wildlife in comparison with out-of-stream benefits. If the USFWS contention were applied throughout the state, no out-of-stream diversion could be justified. That would be unreasonable and contrary to water right statutes of California. The Board will continue to examine all information as it becomes available, and at appropriate intervals will subject the standards to public review and possible modification. A key factor in this

review will be reasonableness, as it must be for the people as well as the natural environment of the state to prosper.

Comment: A major shortcoming of the plan is its limited geographical coverage. The success of fish and wildlife populations in the Delta and Suisun Marsh, through Delta Plan water quality standards, may result in failures in either upstream or downstream portions of the total system. Without a comprehensive plan covering the entire system, it is almost impossible to depend on a limited plan to do an adequate job in maintaining the fish and wildlife beneficial uses of water throughout the entire basin. (USFWS)

Response: Contrary to the USFWS comment, basin-wide comprehensive plans currently exist not only for the Central Valley but also for all other areas of the state. The existing water quality control plan for the northern Central Valley (Basin 5ABC Plans) and water right decisions which require downstream releases of water for fishery protection at appropriators' diversions address these needs of fish and wildlife. The Delta Plan will not modify the specific protection afforded by these other Board and Regional Board actions except with regard to salinity and flows in the Bay/Delta Estuary. The impacts of the Delta Plan on fish and wildlife in the estuary are discussed in the EIR. Historically, regulated flows surplus to project needs have resulted in additional fishery and recreational benefits. As project demands build up, these surplus flows are expected to diminish. This would be the case under both the existing basin plans and the Delta Plan. The Board will assess the effect of

surplus flow decreases on the adequacy of standards for protection of the fishery outside of the Bay/Delta estuary in its periodic review of the basin plan standards.

B. Fish Standards

Comment: The standards of the draft plan limit CVP diversions to 3000 cfs in May and June. This will require offsetting diversions of CVP water through SWP facilities later in the year. (DWR)

Response: The CVP water right permits will be conditioned to allow diversion or rediversion at the SWP pumping plant of water later in the season under the CVP permits to the extent of reduction in CVP May and June diversions to accommodate this standard.

Comment: We do not concur with the judgment that the standards in the plan will maintain all fishery resources at levels which would exist in the absence of the CVP and SWP. The plan should explicitly recognize this. (Fish and Game, DEAC, USFWS, Sierra Club)

If the Board finds that prevention of continuing damage to the Delta in the near future is not in the public interest, it should clearly state this in the plan. (Sierra Club)

Response: When read in context, the plan and EIR do not make the assertion that the plan will maintain all fishery resources at without project levels. The analysis of impacts, Chapter V of the EIR, makes clear that fishery related impacts apply only to striped bass. However, we agree that this point is not made sufficiently clear in other portions of the plan and EIR and have modified these documents to reflect our intent.

More detailed analysis, with some revision of the fishery standards, shows that the estimated Striped Bass Index under the Delta Plan is 79. Allowing for Fish and Game's concern that the mitigation level of 71 stated in the plan is an underestimate^{1/}, the Board's position is that the Delta Plan sufficiently approaches mitigation of project induced impacts for striped bass. A higher level of protection with present Delta facilities is not in the best public interest at this time.

A statement has been added to the Delta Plan noting that without project conditions for other fishery species may not be fully attained during the effective period of the plan.

Comment: The use of information documenting the needs of a few species to set water quality standards to satisfy the needs of the total estuarine biological community must be viewed with extreme caution. In choosing the single species of striped bass, the best that can be hoped for is that striped bass will be preserved and some other species might also indirectly benefit. Additional information on other estuarine species is needed. Fish and Game's information on striped bass, neomysis and the Suisun Marsh food plants is beginning to satisfy such information needs. (USFWS, Fish and Game, EDF)

USFWS will make every effort to communicate information gathered by its Instream Flow Group that is applicable to the Bay/Delta system. (USFWS)

^{1/} A detailed discussion of the factors involved relative to Fish and Game's concern is presented in Chapter V of the EIR.

The statement in the paragraph at the beginning of page III-2 of the draft plan, "The Department of Fish and Game (Fish and Game) indicated during the hearing that it is concerned with protection of a wide variety of fish species, but believes use of a few key species is appropriate to measure estuarine fishery response (Fish and Game Exhibit 11, page 6; RT Volume XXIII, pp. 15 and 16) is a misunderstanding of the evidence. This misunderstanding has led to a major error in the conclusions of the draft plan which must be corrected. The term "key species" should be eliminated since it obviously means different things to different people. The truth of this matter is that any reduction in the use of Delta channels as canals to carry water across to the pumping plants and any limitations on the projects' ability to reduce outflow, or any increase in their ability to augment outflow at certain times of the year will benefit many different kinds of organisms in the estuary. Such reductions in diversion are not the only conditions required for protection of those organisms. These matters should be clarified in the cited paragraph. (DEAC)

Response: The Board is aware that caution must be exercised when using needs of a few key species to develop Bay/Delta standards. There are numerous other species whose environmental needs are not so clearly understood. Although understanding of the needs of species like striped bass, salmon, food species in the Marsh, and others is continuously increasing, additional factual information will be needed in order that better and more intelligent decisions can be made. The assistance of USFWS in gathering and making available such information will be most helpful.

We have modified the paragraph cited by DEAC to reflect more accurately the use of the term "key species" in Fish and Game's testimony. As DEAC noted, Fish and Game Exhibit 11, page 6, says, "The standards were established, based on

studies of selected fish and wildlife resources. The standards are expected to benefit species other than the target species." Mr. Chadwick describes Fish and Game's concentration on "a few key species" by stating, "We have particular species that we are particularly concerned about and felt that it was most reasonable to concentrate evaluations on these. We also did it simply for economic reasons. You can appreciate the number of questions which you can ask about the diversity of species in the estuary is almost endless, and if you set about to study in detail the life history of all the various fishes and the vertebrates, you have an extremely large problem. So, we adopted a program at the outset of studying key species" (RT Volume XXIII, pp. 15 and 16). Mr. Chadwick then goes on to describe how the outflows required for striped bass, and the curtailments of exports, will also benefit other fishes. This testimony reflects the Board's understanding of the use of the term "key species" in developing the fish and wildlife standards.

Comment: The analysis in the draft plan for striped bass is the best quantitative analysis that can be made of 1980 level without project conditions at this time. However, for several reasons we believe it underestimates without project striped bass abundance and the degree of protection which will be afforded in the interim. These reasons are:

1. The analysis does not include project caused losses after July. Millions of striped bass are drawn to the CVP-SWP fish screens after July, and food supplies in the Delta are depleted by

the draft of water to the pumping plants. As our testimony indicated, losses earlier in the year are more significant than losses after July, but the latter cannot be assumed to be insignificant.

2. Survival will gradually decrease after 1980, as reductions in unregulated flow bring flows closer to the minimums specified by the objectives.
3. Project caused flow reductions earlier in the spring place stresses on striped bass. For example, our testimony indicated the striped bass spawning objective provides minimum rather than optimum conditions, with additional stress when the dry year relaxation is in effect. (Fish and Game)

Response: We have reviewed Fish and Game's comment and agree that the estimate in the draft plan of without project striped bass abundance is likely an underestimate. Both the plan and EIR have been modified appropriately.

C. Suisun Marsh

Comment: The plan requires completion of permanent Suisun Marsh facilities by January 1982, but these facilities cannot be completed before the fall of 1984. Federal participation will be an essential element in implementation of these facilities. (Department)

Response: The Delta Plan defers accomplishment of the projects' mitigation responsibilities to Suisun Marsh on the basis of reasonableness and interim Marsh protection efforts currently underway by the Department and the Bureau. Public interest requires that mitigation of project impacts be accomplished as soon as practical. However, comments received from the California Water Fowl Association (see following comment and response) as well as the Department indicate that the 1982

date is unrealistic. Consequently, modifications have been made reluctantly in the plan extending the compliance date for full project mitigation of the Marsh to October 1, 1984 and increasing interim Marsh protection in dry and critical years. The project operators should not view this date as a target to shoot for, but rather as a date by which full mitigation will be required through whatever means are available to the projects.

Comment: We are concerned with the open-ended nature of the interim standards, and that concern is increased by the Department's conclusion that permanent facilities cannot be completed by January 1982. To alleviate those concerns somewhat, we recommend that you modify the plan to commit the Board to reopening the hearing in July 1979 to consider Suisun Marsh protection further. That hearing should have as its purposes the adoption of a firm schedule for the completion of permanent Marsh facilities and the adoption of permanent standards for the protection of the Marsh regardless of whether the permanent facilities are completed on schedule. These conditions should be made part of the projects' water right permits. (Fish and Game, SRCD)

The Board should reopen the hearing in 1979 to set a firm timetable to protect Suisun Marsh at historical levels by 1988. (Sierra Club)

Response: The Board also is concerned with the interim protection afforded the Marsh and the time frame for its full protection. Reopening the hearing in 1979 would not provide sufficient guidance to the projects in the design of possible protective facilities. For this reason, the plan has been modified to require that standards at specific locations in the Marsh, recommended in Fish and Game Exhibit 11 (Table 1, p. 14), be met effective October 1984.

Comment: The term "supplemental" should replace the term "alternative" when referring to long-term Marsh protection. Those interested in preservation of Suisun Marsh are unlikely ever to agree to a completely alternative water supply, even though it has been suggested that the Marsh could be watered with reclaimed sewage combined with small amounts of fresh water from elsewhere. While the draft plan on page VI-8 admits that "The interim objectives make no provision to mitigate the adverse effects of the project on the Marsh", it does not really describe what those adverse effects may be or how they will occur. We commend the Board for adopting the Four-Agency group's time schedule for completion of the necessary Suisun Marsh mitigation facilities, and urge expansion of the description to include the so-called "interim facilities" as recommended by the Suisun Resource Conservation District. Other interim conditions can be applied to reduce the risk prior to completion of the permanent supplemental water supply facilities. They are described by the Suisun Resource Conservation District. (DEAC)

Response: The Board is aware of the probable solutions for Suisun Marsh. We agree that "supplemental supply" is a more descriptive term than "alternative supply". This change has been made. The statement concerning interim mitigation on page VI-8 of the draft plan has been modified. Partial mitigation in the interim is included in the plan and will be implemented through construction by the Department and Bureau of interim Marsh facilities. This requirement will be imposed on the projects' permits in the water right decision. Full mitigation is required by October 1, 1984. Because this date is later than the 1982 date in the draft plan, the interim Suisun Marsh water quality standards have been adjusted to provide greater protection to the Marsh until the mitigation facilities are completed. The degree of interim protection provided is discussed in the Final EIR.

Comment: The plan should be modified to stipulate the construction of specific interim facilities to protect the Marsh and to condition the water right permits similarly. (Fish and Game, SRCD)

Response: This was the Board's intent in the draft plan. To achieve partial mitigation of project induced impacts, the Delta Plan and water right decision will require that the Department and the Bureau develop and implement suitable plans with other agencies to achieve the following goals by January 1, 1980:

1. Delivery of water from Montezuma Slough onto, and management of water on, certain wetland areas located on Grizzly, Simmons, Wheeler, Dutton, Van Sickle, and Hammond Islands, presently flooded with water from Honker, Suisun, and Grizzly Bays.
2. Delivery of water from Goodyear Slough onto, and management of water on, certain adjacent wetland areas, and provision of outflow from Goodyear Slough into Grizzly or Suisun Bays.

The development and implementation of these plans shall fully comply with all state and federal laws.

Comment: Following the construction of any interim facilities, a set of objectives should be established based on the salinity levels at the mouth of Suisun Slough. Control of salinity at Suisun Slough is more meaningful than at Chipps Island.

Further, from October through May in wet, above normal and below normal years, the salinity standards should be the predicted salinities shown in Figure V-4 of the Draft EIR. Since these standards reflect the average salinity levels

predicted to occur in each year type prior to completion of mitigation facilities, the operation of the projects should not be significantly affected by any variation from the norm.

The current Marsh standards allow for relaxation in dry and critical years whenever the projects are taking deficiencies in "firm" water commitments. If the standard is not modified, the Marsh will be forced to accept a quality of water which virtually destroys its productive capability in a critical year, while the water users may very well have their cake (Class 1 or Table A entitlements) and only lose the frosting (surplus or interim water).

The need for better interim protection is heightened by the fact that permanent Marsh mitigation facilities will likely not be constructed by the projects before October 1983. (SRCD)

Response: The Board agrees that there is a need for better interim Marsh protection because of the length of time involved before accomplishment of full mitigation of project induced impacts. Therefore, the Suisun Marsh standards have been modified to allow no relaxation of the 12.5 EC objectives at Chipps Island in any year from January through May, which is the most critical period for the Marsh. The impact on exportable yield of this modification is a reduction of about 35,000 acre-feet. The impact of this and other changes are quantified in the Final EIR.

SRCD's recommendations have not been specifically accepted for the following reasons:

1. Sufficient information is not now available to convert the Chipps Island standards to a corresponding Suisun Slough quality. The permanent standards will become effective at the mouth of Suisun Slough by

October 1, 1984. The necessary information is unlikely to be available sufficiently in advance of that date to allow for development and implementation of the suggested conversion for a meaningful period of time.

2. SRCD's assertion that attainment of average wet, above normal and below normal year conditions between October and May, inclusive, would not have a significant effect on the projects is not well founded. The year classification system results in application of each year type roughly corresponding to the calendar year. If a water year (which ends September 30) is classified as a wet year, the classification continues from October through January. If the fall and early winter of that new water year is the beginning of a very dry year, the projects would be required to release large amounts of storage to simulate average wet year conditions as required by the standards. Releases of such magnitude could have a very substantial impact on the projects. The SRCD recommendation was made on the assumption that operations would not be adversely affected. However, its impacts could be substantial. Because of these factors, the recommendation has not been accepted.

3. The Board's approach in modifying the Suisun Marsh standards provides better protection to the Marsh than SRCD's recommendation to tie relaxation of standards to deficiencies in firm supplies rather than scheduled supplies. The Delta Plan standards allow no relaxation of Marsh standards during the time of the most critical water quality needs in the Marsh.

Comment: The Board should make clear its policy toward the long-term water quality standards of the Marsh. Our recommendation is that these standards include a "without project" standard in wet, above normal, and below normal years with relaxation of the draft Four-Agency Marsh Table A or B standard in a critical year and an intermediate standard in a dry year. In this connection, it is important to recognize that the draft Four-Agency Marsh standard (Fish and Game Exhibit 11, p. 13, Table A) can only be described as a negotiated compromise. It simply represents the maximum tolerable salinity in order to get any meaningful waterfowl food production in the Marsh. This survival level concept is not contemplated in any of the other standards proposed in the plan. It certainly should apply to the Marsh only in critically dry years. (SRCD)

Response: The District's characterization of the Four-Agency Fish Agreement Marsh standard does not properly represent the information before the Board. Considerable testimony was given on the development of Table A of Fish and Game Exhibit 11. It was designed on the basis of the best available information to achieve 90 percent of optimum seed production of the valuable waterfowl food, alkali bulrush, and favors the production of fat hen and brass buttons. The information was first presented in

Table VI-3 of Fish and Game Exhibit 3 during Phase I of the hearing during which the needs of each beneficial use were established without regard to the achievability of the needs. Fish and Game further stated that these standards are expected to provide "full protection" to the Marsh provided water management facilities on the duck clubs are upgraded. While better water quality would allow less intensive management and production of different waterfowl foods in the Marsh, the Board does not believe the public interest requires without project or historical conditions in the Marsh in order to protect this valuable resource. Protection of the Marsh is not only the responsibility of the State through ensuring adequate water quality (which the Delta Plan does under its long-term standards), but also the responsibility of landowners through management of this resource in an efficient manner. This sharing of responsibility is wholly consistent with the development of other standards in the Delta.

Concerns are raised regarding the desirability of attaining historical or without project water quality. Concerns are also expressed on the cost burdens of upgrading on-club water management facilities. These issues are more properly addressed between the landowners and the CVP and SWP, who are charged with the responsibility of mitigating their impacts on the Marsh.

Comment: The statement on page V-7 of the draft plan that "...long-term protection for the Marsh in low runoff years can be guaranteed only through construction of physical facilities..." is without regard to water conservation. (FOR)

Response: The rest of the referenced statement goes on to say "...proper management of the Marsh lands and a substitute supply." This statement is made in context with a discussion that use of water to protect the Marsh solely with outflow is not in the public interest. The quantities of water necessary to protect the Marsh through outflow are so large that such use would not be in the public interest even when large scale conservation and reclamation efforts are implemented. We have indicated that proper management of Suisun Marsh is a necessary conservation element for its long-term protection.

Comment: It would be highly desirable for the average reader to be able to compare easily in one graph for each year type the interim Suisun Marsh standard, the predicted 1980 Marsh water quality, the draft Four-Agency Agreement Marsh objective and without project water quality. (SRCD)

Response: We have considered a graph of this type and believe it inappropriate. Each of these items is discussed in separate concepts in the development of the standards and the analysis of their impacts. While the redrawing of these graphs might be meaningful to the most knowledgeable readers, we believe that the suggested graph would be overly complicated and would confuse the discussion for most readers.

D. Specific Comments

Comment: Under the heading "SCOPE OF BOARD ACTIONS", instead of simply saying that the uncertainty associated with proposed Delta transfer facilities makes the setting of long-term requirements premature, the plan should stress the evidence that continuation of project exports and full mitigation of project damages cannot be made compatible without such facilities and that, prior to construction of such facilities, the Board will establish operational criteria to ensure protection of the estuary to the full extent of the projects' physical capability. (DEAC, Sierra Club)

Response: Establishing specific standards for various alternatives yet to be selected is not a very productive exercise. However, the Board has set specific policy guidance related to both near-term goals with present facilities and long-term goals with possible future facilities. These goals are set forth in the EIR and plan and have been evaluated in the context of protecting fish and wildlife resources in the public interest. Additional statements in the plan concerning possible standards for future facilities are not necessary.

Comment: Statements are made in numerous places in the plan and EIR that upstream storage releases have increased summer and fall flows. However, comparison of with project and without project conditions indicates that the CVP and SWP have reduced September, October and November outflows. Differences between with project, without project and historical conditions are confusing. Hydrographs of typical critical through wet years should be included in the plan showing these differences. (DEAC)

Response: DEAC has misinterpreted the statements in the plan and EIR. In context, these statements generally refer to the effects that all upstream storage facilities (not just those of the CVP and SWP) have had historically on Delta outflow.

Therefore, comparison of with project and without project outflows cannot be made on the basis of these statements. The comparison which can be made from the statements is to pre-project and post-project outflows. This comparison shows that fall flows will decrease as export rates reach the 1980 level. Reference to this decrease in fall flows has been added in the Delta Plan. Hydrographs for each typical year type showing the differences between historical, 1980 level with project and 1980 level without project flows have also been incorporated into the Delta Plan and Final EIR.

Comment: Statements that Department Exhibit II-12 (without project conditions) is a close approximation of actual without project conditions is not a fair analysis of the evidence. (DEAC)

Response: This exhibit is controversial and certain general assumptions concerning it have been made. The exhibit was subjected to extensive cross-examination during the hearing and was also the subject of many meetings and analyses since. Although refinements can and should be made, the Board believes the information in the exhibit is the best currently available analysis.

Comment: The statement is made on page III-5 of the draft plan that "The striped bass fishery in the southern Delta at one time was significant, but has declined substantially due to a combination of reduced inflow from the San Joaquin River and degraded water quality (RT Vol. XXIII, p. 58)." No confirming evidence of this statement can be found on page 58 or elsewhere in the testimony of Fish and Game. The most

probable cause for the loss of the striped bass fishery in the southern Delta has been the use of Delta channels as canals to carry water to the pumping plants. Mr. Chadwick, in answer to questions about maintaining the fishery in the southern Delta, attributes the loss to "...excess of flow and the direct effects of the diversion that we are talking about, as opposed to inadequacies of flow or inadequacies of water quality" (RT Vol. XXIII, p. 63). He went on to describe the problem in more detail, but there is no implication that the historical decline was due substantially to a combination of reduced San Joaquin River inflow and degraded water quality, as the draft plan states. (DEAC)

Insufficient attention is addressed to the fisheries in the lower San Joaquin River. (CDWA)

Response: In answering a question regarding some requirements for additional San Joaquin River flows south of the head of Old River to maintain the fishery in that area, Mr. Chadwick states, "There are fishery resources in that area that certainly have been degraded as a result of the changes that have occurred. The salmon runs are down very substantially and we have information and have been trying to get flows to remedy that situation upstream from the Delta. That area used to be important for both striped bass and shad, and it no longer is due to a combination of degraded water quality in the terms of salinity and probably also flow" (RT Vol. XXIII, p. 58). This testimony supports the statement in the plan.

The term "southern Delta" in the draft plan evidently evoked a much larger area to DEAC than was intended. For this reason, the paragraph concerning striped bass fishery in the southern Delta on page III-5 of the Delta Plan has been expanded to

include not only the effects of reduced flow and degraded quality in the San Joaquin River south of the head of Old River, but also the project induced effects in the rest of the southern Delta. These effects include reversed salinity gradients, reversals in direction of flow, high net velocities which reduce food production and direct fishery losses due to export of water. These effects are all addressed in the EIR.

Comment: The statement on page VI-2 of the draft plan that "Until additional project facilities are constructed and operational, the recommendations provide, except as to Suisun Marsh (discussed below), for maintenance of levels of fish and wildlife in the Delta estuary which would have existed in the absence of the SWP and the CVP", is not true. The citation (Fish and Game Exhibit 11, page 4) is to the draft Fish and Wildlife Agreement, but nowhere does that draft agreement imply that the fish and wildlife resources will be maintained at "without project" levels prior to construction of an appropriate Delta transfer facility. (DEAC)

Response: It was not our intent to infer that the draft Four-Agency Fish and Wildlife Agreement used the attainment of without project levels for fish and wildlife as an interim goal. The placement of the citation to the agreement was incorrect. The wording in the Delta Plan has been modified accordingly.

Comment: The last paragraph on page VI-7 of the draft plan states "The striped bass objectives are expected to benefit species other than striped bass, as previously discussed. The spring and early summer flows provided in the above objectives coincide with the spawning and migration period of many species which presumably are adapted to natural high flows occurring

during this period." The paragraph implies that April outflow of 6,700 cfs followed by May and June outflows ranging from 14,000 cfs in wet years down to 3,000 cfs in critical years will adequately take care of the other fishes. This is nearly the opposite of what most biologists believe. The paragraph should reflect the biologists' concern that winter and spring outflows have been reduced, and will continue to be reduced under the Delta Plan. We do not know what effects this will have on any fishes, including striped bass. (DEAC)

Response: The paragraph on page VI-7 of the draft plan should not be construed to imply that flows proposed in the plan are optimal in all years. However, on the whole the flows and export curtailments of the Delta Plan provide better protection to striped bass than the existing basin plan, which makes no provision whatsoever to provide outflows greater than 4,500 cfs for striped bass survival nor does it have any provisions for export curtailments.

The paragraph will be rewritten to reflect exact Fish and Game testimony during the hearing (RT Vol. XXIII, p. 16):

"The striped bass spawning and flow standards obviously relate also to the protection of salmon and shad, which are migrating either upstream or downstream through the estuary at the same time and we discussed evidence related to how flows affect salmon. They also related to the Suisun Marsh.

"Obviously, flows, moderately high flows in April and May are going to relate to the salinities that are available in Suisun Marsh.

"In the curtailment for striped bass that we recommended, curtailment of exports for striped bass, this comes at a period when the largest number of small fish of many different species occur in the estuary, so that curtailing exports to protect striped bass is going to protect other fishes such as catfish and quite a variety of others.

"So, we believe that there is a considerable overlap between the standards that we are proposing for specific identified purposes and benefits which will be achieved for other species, which we have not specifically identified."

The reference in the plan to Figure III-2 is appropriate. DEAC may have confused Figure III-1 (striped bass life cycle) with Figure III-2 which depicts the general times of occurrence of salmon, steelhead, rainbow trout, and American shad in the Sacramento-San Joaquin estuary. Figure III-2 graphically illustrates that much of the upstream and downstream migration for these fishes occurs during the April through July period, as stated by Fish and Game. The figure also shows that the downstream migration of shad occurs primarily in the fall.

Comment: The description of salmon migration on page VI-8 of the draft plan and the proposed salmon objectives imply that Fish and Game agrees that the minimum flows in the Sacramento River described by those objectives are necessary for both the upstream and downstream migration of salmon through this estuary. That is not true.

The plan establishes no conditions to protect young salmon. It allows the projects to continue lowering food production in the upper estuary, and allows the continuation of flow reversals that the evidence shows are damaging to both young and adult salmon. The sentence, "However, the information necessary to refine this objective is not currently available (Fish and Game Exhibit 11, p. 6)" is true only if it refers to the magnitude of Sacramento River outflows necessary for the upstream migration of adult salmon, post-Peripheral Canal. (DEAC)

Response: In reference to the salmon migration standard, Fish and Game states that this standard is "...based on judgments made by CDF&G biologists as to minimum satisfactory flows for salmon" (Fish and Game Exhibit 11, Appendix C, p. 6). The

draft plan states on page VI-8, "The proposed salmon objective reflects the minimum flows which Fish and Game believes would be suitable for salmon migration" (emphasis added). This sentence adequately paraphrases the Fish and Game statement. It does not infer that these flows are optimum for salmon migration. As we stated in answering an earlier DEAC comment, Fish and Game expects the flows and export curtailments identified for striped bass also to provide some benefit to salmon during spring and early summer when a large number of young salmon are in the estuary. This flow standard for salmon applies at Rio Vista. It makes no reference to the San Joaquin River salmon population, which has decreased dramatically due to upstream development and to project impacts within the southern Delta. In Chapter VII of the Delta Plan the Board provides policy guidance for the correction of project impacts within the southern Delta.

Comment: The draft plan states (page VI-12) "the export curtailment, in combination with the spring and summer flows for striped bass survival, is intended to maintain the without project level of this resource". This statement should be deleted unless exports are further curtailed or outflows increased. (DEAC)

Response: The expected survival of striped bass under the Delta Plan is reevaluated in the Final EIR. In the Draft EIR the expected survival for striped bass was based on an operation study that did not include the flows required to meet the agricultural standards of the draft plan. The Department has

submitted an operation study that includes these flows. Based on this operation study, the estimate of the long-term average striped bass survival is 79. Fish and Game commented that the without project long-term average of 71 stated in the EIR was likely an underestimate. For these reasons, the paragraph will be rewritten substituting the word "approaches" for "maintains". To ensure the validity of this statement the Board has modified the Delta Plan to apply the export curtailment provisions regardless of Delta outflow.

Specific Comments of U. S. Fish and Wildlife Service. The USFWS comments are divided into three sections based on degree of generalization of each comment. The sections are (1) an overview section setting forth the overall response of USFWS to the plan, (2) a general remarks section emphasizing their major concerns with the plan, and (3) a specific comments section referring to page and paragraph of the draft plan or Draft EIR. The overview and general remarks sections are incorporated with comments of others elsewhere in the Appendix. Many of the concerns in the specific comments section have been addressed elsewhere in this Appendix in responses to comments of the USFWS overview and general remarks sections either separately or in combination with responses to comments of others. Discussed below are those USFWS specific comments not addressed elsewhere.

Comment: The first paragraph on page IV-7 of the draft plan does not apply to fish and wildlife.

Response: The paragraph has been modified to include the phrase "and to provide environmental conditions for fish and wildlife".

Comment: We were under the assumption that riparian use had increased with the projects (draft plan, p. V-9, par. 2).

Response: Upstream use has increased with the projects because of the effects of storage and the release of summer flows for expanded in-basin uses under water service contracts with the CVP and SWP. The cited paragraph of the draft plan deals with total non-project upstream uses during the low flow season, which includes the effects of both appropriative and riparian uses. Many upstream water users hold both riparian and appropriative rights. Use of water under riparian rights has been essentially stable for many years, and use of water under appropriative rights to unstored flow has not increased appreciably during the July/August period over the last 20 years.

Comment: The last portion of the first paragraph on page V-10 of the draft plan sounds a little contradictory.

Response: The paragraph has been clarified.

Comment: Table VI-1 on page VI-39 of the draft plan states that certain conditions concerning the fish protective facilities must be met provided they are "...compatible with water export rates". This is weak wording and only a guide to what should be done.

Response: The conditions were recommended to the Board during the hearing and received virtually no opposition. USFWS was a party to the proceeding and had no adverse comment on these specific recommendations. Although adherence to these conditions is in part dependent on the good will of the projects,

we believe the approach is reasonable. If the conditions are violated regularly, the Board will consider making these or other conditions more binding on the projects.

Comment: Monitoring and special studies appear limited to the Delta and Suisun Marsh (draft plan, p. VII-12, pars. 1 and 2).

Response: Page VII-9 through VII-19 of the draft plan make clear that these studies are to include the projects' effects on the entire estuary. Areas where this might be unclear have been modified.

Comment: Mention of "San Francisco Bay to the Golden Gate" excludes south Bay and is unacceptable (draft plan, p. VII-13, par. 1).

Response: As discussed on page III-14 of the Draft EIR, San Francisco Bay is composed of both a central and a south bay. Reference to San Francisco Bay includes the entire Bay.

Comment: There is also a small winter run of King Salmon in the Calaveras River of the San Joaquin system (Draft EIR, p. III-77, par. 2).

Response: This information has been included in the Final EIR.

Comment: The discussion of shad spawning is contradictory to information from extensive monitoring studies. Eggs spawned upstream of the Delta would be washed down into the Delta, even at low river flow rates, further and sooner than indicated in the EIR. It appears impossible for young shad to remain near the places where they are spawned (Draft EIR, p. III-84, pars. 2 and 3).

Response: Comparison of patterns of spawning and migration into the Delta for striped bass to those for shad is instructive. Both spawn upstream of the Delta during approximately the same period, peaking around May. Spawning areas overlap considerably, with shad spawning further upstream in adjacent tributaries to the Sacramento system. Fish and Game Bulletin 136, page 103, shows that young shad from the Sacramento River and Mokelumne River systems move into the northern Delta in July, with none in the western Delta at that time. However, by July young bass have reached their peak in the western Delta. Young shad do not appear in the western Delta in large numbers until later in the summer. A figure has been added in the EIR depicting relative catches of bass and shad at the fish screens of the CVP and SWP and also showing this later movement of shad.

Thus, current evidence indicates that while both fishes spawn at similar times and locations, young bass make their appearance in the Delta much earlier than shad. Young shad are not found in large numbers in the Delta until the late summer and fall. Therefore, the primary nursery area for shad is believed to be upstream of the Delta.

Comment: We would like to add that higher flows distribute shad eggs and larvae to a larger area of the estuary just as they do striped bass eggs and larvae. This, coupled with the increased estuarine productivity and improved spawning conditions

resulting from high flows, probably are the controlling factors (Draft EIR, p. III-85, par. 1).

Response: The available information does not support the USFWS contention. At higher flows during spring and early summer young shad are upstream and do not move into the estuary in large numbers until the late summer and fall. The mechanisms controlling young shad abundance are more plausibly explained by the existing paragraph in the EIR.

Comment: If tule perch are presently drawn to the existing pumps in the southern Delta, any increase in pumping will further impact them (Draft EIR, p. III-93, par. 2).

Response: The Draft EIR on page III-93 states that because of their benthic habits plus the fact that the young are born fully formed and capable of swimming, tule perch should be relatively immune to the direct effects of water export increases. We agree that increases in export rates could have an increased impact on this species; however, relative to impacts on other fish species, these impacts would likely be much less.

Comment: The list of species should be updated using the Federal Register list of July 14, 1977 (Draft EIR, p. VII-112).

Response: The list of species on Table III-3 has been checked against the July 14, 1977 Federal Register. No modifications were needed.

Comment: There are no existing tidal marshlands in San Francisco Bay which even approach three miles in width. (Draft EIR, p. III-114, par. 2)

Response: We have consulted with BCDC and they concur with your comment. The reference to width of marshlands has been eliminated from the Final EIR.

Comment: Slightly more descriptive numbers should be given for the presently remaining water surface of less than 400 square miles. Is it the same as that for 1850, that is, 250 square miles of shallow tideland and 150 miles of deep channels? (Draft EIR, p. III-114, par. 3).

Response: The purpose of this paragraph is to illustrate that land reclamation over the last 120 years has greatly decreased the surface of the Bay. Therefore, we believe it is sufficient as written. Assuming there has been no change in deep channel area, it can be computed from information in the paragraph that shallow tidelands have been reduced by at least 75 square miles.

Comment: USFWS is not satisfied with the Four-Agency Agreement and believes the interim measures are inadequate to prevent further decline of such resources as American shad, striped bass and resident species. The reference to fishery resources should be limited to striped bass because of the lack of information on population levels (Draft EIR, p. V-39, par. 1).

Response: The cited paragraph has been modified to reflect this concern.

Comment: Use of the word "objective" when actually referring to water quality criteria is somewhat misleading (Draft EIR, p. VI-2, par. 1).

Response: The use of the term "objective" is proper in the context cited. However, for consistency among the plan, EIR and water right decision the term "water quality standard" has been used in the Delta Plan and Final EIR, as set forth in a footnote in Chapter I of the Delta Plan.

Comment: The plan has many places where the wording is weak. Words like "should" must be changed to "will". More affirmative wording and word changes are needed to convey that the Board is truly a water control agency.

Chapter V of the EIR is too complex for the many readers to "wade through". It should be more simple.

The Plan and EIR are not drafted to stand alone. Throughout both documents, conclusions are reached based on data contained in other documents which are not generally available. The final reports should be modified so that sufficient information is present to support the conclusions in each.

Response: The EIR has been rewritten to address these concerns. However, complex technical information is referenced to aid in the readability of the document. All referenced material is a matter of public record and can be made available upon request.

E. Future Studies

Comment: The need for additional ecological data is mentioned throughout the plan and EIR. Certain monitoring programs and special studies are also mentioned. However, there is no reference in these documents to the Four-Agency Ecological Study Program from which much of the Fish and Game testimony was derived. Ecological studies are too often fragmented and not well coordinated. The Board has an excellent opportunity to assist in assuring that all research efforts conducted in the

Bay/Delta system are fully coordinated and working toward a common goal. The Plan should refer to this major study program and define clearly how it, as well as other programs, can mesh effectively with the future study proposals of the Board. (USFWS)

Response: The Board is fully aware of the Four-Agency Ecological Study Program and the valuable information it has developed over the years. The study program group has coordinated the implementation of the Decision 1379 monitoring program, and the research efforts in the Delta of the four participating agencies (Bureau, USFWS, Department, Fish and Game). The Board will establish, as terms and conditions of their water right permits, monitoring and special study goals that must be accomplished by the Bureau and Department. The Four-Agency Ecological Study Program is a good functioning nucleus for the implementation of the programs necessary to accomplish these goals. Other researchers in the estuary will be asked to evaluate their programs in light of these goals and the Four-Agency studies. The Board will assist in coordinating these program activities with the activities of other agencies to minimize duplication or to enhance the usefulness of both the data collected and the study results.

VI. SAN FRANCISCO BAY

Comment: Additional study is necessary to determine the extent, if any, of the need for surges of outflow to San Francisco Bay. (DWR)

Response: Chapter VII of the Delta Plan addresses the lack of technical information concerning San Francisco Bay, and discusses areas for which more study is needed. The Board will be working with other state, federal and local agencies to develop a comprehensive program to ensure that essential studies are initiated in a timely manner.

The quantity and frequency of unregulated flows currently available to San Francisco Bay could be reduced substantially by future project facilities. A major share of the burden of necessary studies relating Delta outflow to Bay beneficial uses rests with sponsors of such facilities. This responsibility was recognized in draft legislation considered by the California Legislature over the past year.

The Board will require the Department to conduct the necessary technical studies related to project impacts on the Bay under Section 13165 of the Water Code. In view of the need to initiate these studies as soon as possible, funding for these studies should be included in the project operators' on-going planning programs.

Comment: All references or recommendations for future specific quantities of outflow to San Francisco Bay should be deleted from the Delta Plan because of insufficient information.
(DWR, KCWA, TLBWSD)

Response: San Francisco Bay is part of the estuary encompassing the Delta and Suisun Marsh. Information on the relationship of Bay needs to Delta outflow is very limited. In light of this, the Board has not included standards for San Francisco Bay in the Delta Plan. However, there are strong indications that the environment of the Bay relies heavily on the freshwater influence of Delta outflows.

Even though no additional project facilities (other than enlargement of SWP Delta pumping plant capacity) are expected to be constructed during the effective period of the Delta Plan, the Department and Bureau are currently planning substantial additional project facilities. Obviously, some planned future project facilities will reduce the freshwater outflow currently available to the Bay. The impact on the Bay of this reduction must be understood prior to finalization of plans for operation as well as construction of such facilities. It is on that basis that the Board has provided guidance regarding future facilities, even with the limited knowledge that currently exists. Estimates of necessary Delta outflow cover a very wide range. The Board's policy guidance for Delta outflow is a starting point in Bay protection considerations. Nonetheless, this policy guidance will impose no requirements on the projects.

Comment: A major shortcoming of the draft plan and the Draft EIR is the manner in which San Francisco Bay is addressed. Estuarine freshwater needs are well documented in the literature and common knowledge to estuarine biologists in other areas of the country. This fact appears to have been purposefully ignored throughout the draft plan and Draft EIR. Estuarine production which is dependent on detritus and nutrients supplied by freshwater inflow was not considered. If the Board believes that the needs of San Francisco Bay cannot be met under the plan, they should make that statement clearly. (USFWS)

Response: The detailed discussion in the EIR on estuary productivity is not contained in the section on San Francisco Bay but is contained logically in the sections on phytoplankton and zooplankton. The section on San Francisco Bay has been modified to make reference to the phytoplankton and zooplankton sections.

The Board is aware of the classical work by Odum, de la Cruz, Darnell and others which links organic detritus to primary and secondary production in small estuaries. We have also consulted those familiar with work done in Chesapeake Bay and other large estuaries. The assertion that "estuarine freshwater needs are well documented in the literature and common knowledge to estuarine biologists" is not founded in fact. The available literature shows that the total amount of nutrients entering estuaries is often correlated with flow. However, this does not mean that production in the estuary is limited by the inflow of nutrients. Recent work by Arthur and Ball (April 1978) entitled Entrapment of Suspended Materials in the San Francisco Bay-Delta Estuary supports the

emphasis in the EIR that other factors such as the relative position in the estuary of the entrapment zone have a more direct effect on estuary productivity during low flow periods than do nutrient concentrations.

Chapter VII of the Delta Plan expresses the Board's commitment to protect San Francisco Bay. The needs of the Bay are not well understood at this time, making a determination as to whether those needs will be met mere speculation. However, Chapter VII of the EIR points out that the large unregulated flows of concern to USFWS will not be materially reduced during the effective period of the plan.

Comment: The 10,000 cfs surge flow recommendation for San Francisco Bay should be viewed with considerable reservation as it has insufficient basis. It is likely an underestimate of Bay needs. Other sources suggest much higher flows. Kelly and Tibbets (1977) suggest an outflow of two million acre-feet during two months. The Water Resources Council in its National Water Assessment of 1975 provides a preliminary guide relative to outflow needs of San Pablo Bay ranging from 6,400 to 24,000 cfs for the months October to May. Neither of these values are mentioned in the plan or EIR. The point is that the plan and EIR must reflect the outflows based on all educated guesses currently available and not be "locked" into just one which happens to be the lowest. (USFWS)

Response: The Board disagrees that either the plan or the EIR must include guesses about environmental needs. Both the Delta Plan and the EIR must be factual in nature. When dealing with biological systems assertions of fact are often difficult to establish. Available information must be thoroughly evaluated in drawing any conclusions. This is

especially true in the Delta where the consequences of an improper conclusion could have serious repercussion to a large segment of the state. We have evaluated not only the Kelly and Tibbets report but also the studies by Imberger, et al (1977). Flow estimates in both studies are purported to achieve salinity stratification. The report by Imberger is a better technical evaluation of available information. The needs for outflow to maintain estuary productivity are just beginning to be understood. The National Water Assessment of 1975 referred to by USFWS is not expected to be completed until 1979. The EIR does not make reference to flows unless their basis can be evaluated. Both the plan and EIR indicate that the planning guideline flows for San Francisco Bay may not be adequate to protect the Bay and that further studies are needed to better define Bay outflow needs. The Board's position on San Francisco Bay is set forth in more detail in responses to comments of DEAC and Fish and Game.

Comment: The Board's expression of responsibility for protection of the Bay against project damages and of the need to preserve some unregulated outflows is welcome. However, the emphasis in the draft plan on short pulses of 10,000 cfs is unwarranted. Consultants to ABAG and others who testified in the hearing have noted that while such short pulses of rather low outflow cause salinity stratification down as far as the north end of South Bay, there is no evidence that those short pulses are adequate for Bay protection. It would be more useful to recommend that water development in California be aimed at capturing the truly large unregulated outflows which still occur in the winters of wet and even normal years, and leave alone what remains of dry and critical year unregulated outflows to protect the Bay. This certainly should be done until we know that the dry year unregulated outflows can be reduced with safety. (DEAC)

Fish and Game believes the policy guidelines for outflow to protect the Bay should not be construed to indicate that fish and wildlife resources are likely to be protected if future storage facilities result in typical winter maximum flows of 10,000 cfs. Such a drastic change from present conditions would cause substantial changes in populations of aquatic organisms. (Fish and Game)

The relatively small pulses of 10,000 cfs of Delta outflow are not adequate for protection of San Francisco Bay. (LWV)

We support fully the inclusion of San Francisco Bay in this plan as upstream developments affect the Bay and anadromous fish must pass through the Bay before migrating upstream. The recommended "pulses" of outflow may not be sufficient, and we recommend protection of dry and critical year unregulated flow to the Bay. (Sierra Club)

Response: The Board agrees that there is no evidence that the short bursts of flow addressed in Chapter VII of the plan are adequate for Bay protection. Statements as to the adequacy of certain environmental conditions infer that the environmental needs of the Bay are understood and well defined. Such is not the case. However, the available information does suggest that salinity stratification could provide biological benefits to the Bay. For this reason, the 10,000 cfs flows will remain as policy guidance. Provision of this flow should not be construed by the projects as representing their sole responsibility for Bay protection. As better information becomes available as to the needs of the Bay, this guidance will be reevaluated.

Comment: The decision to protect the Marsh through mitigation measures in lieu of solely with Delta outflow represents an

essentially irreversible commitment to a continued decline in San Francisco Bay water quality. Although sufficient information does not exist to determine the environmental impacts of such a decline, this decline represents a possible adverse impact of the plan. Because CEQA requires the mitigation of possible adverse impacts, the Board should

1. state explicitly in both the Delta Plan and the Final EIR that the plan's long-term impacts on the Bay are largely unknown;
2. take primary responsibility for determining the impacts on the Bay of diversions to storage and Delta exports by expanding the responsibilities of the Board's Delta Unit to include San Francisco Bay and giving it the task, in cooperation with other agencies, of developing the necessary information; and
3. state explicitly in the plan that any water right decisions, modifications to existing water right permits, assumptions as to firm exportable yield of the water projects, or any other action based on the plan and the Final EIR will be reviewed and modified as necessary in light of the information developed in the future on the effects of freshwater inflow into San Francisco Bay. (BCDC)

Response: The Board has found, as indicated in the EIR, that full protection of the Marsh to meet the current Basin 2 Plan solely with Delta outflow is not in the public interest. Thus, an assumption that the Board would rigidly enforce the Basin Plan Suisun Marsh standards without regard to available upstream supplies if no action were taken is not sound. For this reason, the "no action" alternative, against which the Delta Plan is measured in accordance with CEQA requirements, is described in the EIR as the basin plan without full protection to Suisun Marsh (Alternative IB).

The EIR has been modified to include additional information regarding Delta outflows to San Francisco Bay. The best available information indicates that bursts of uncontrolled Delta outflow produce significant salinity changes in the Bay. These often large uncontrolled outflows appear to be important factors in the protection of the Bay. The EIR evaluates the expected uncontrolled flows under both the Delta Plan and the "no action" alternative in order to identify any significant differences in their occurrence. The EIR shows that the Delta Plan will not significantly reduce these uncontrolled flows below those of the "no action" alternative. Therefore, no significant adverse impact to San Francisco Bay will occur due to the Delta Plan. However, there is a real potential for impact on the Bay when future upstream facilities are constructed. For this reason, the Delta Plan provides that the project operators conduct studies of the environmental needs of the Bay, particularly on how these needs are satisfied through Delta outflow. This information is essential before the Board can consider any new applications to appropriate water for additional export from the basin. The Board will take an active role in such studies to ensure that they are carried out in a manner to provide useful and timely information.

Comment: The draft plan is inadequate in its failure to commit a concrete acre-foot amount at specific periods of the year

of flow surges for San Francisco Bay, on top of a base commitment of outflow to the Bay throughout the year. On the contrary, the plan commits the remaining uncontrolled flows (900,000 AF/year) to export. (FOE, EDF)

If further study is needed to establish the flow needs for San Francisco Bay, it should be done during the environmental review. (FOE)

Response: A specific flow reservation for San Francisco Bay is neither necessary nor realistic at this time. Not only is sufficient information lacking to establish levels to ensure the protection of the Bay, but also the best information available indicates that conditions important for the Bay will not be modified by the Delta Plan beyond those which would exist if the Board took no action at this time.

The reference to 900,000 acre-feet is unjustified. That estimate was made by the project operators based on a number of uncertain assumptions. The inadequacies of this estimate are discussed in detail in the response to other EDF comments.

VII. METHODOLOGY (TECHNICAL REFINEMENTS)

Comment: Technical adjustments need to be made in six areas to the Board's methods of developing Delta agricultural and municipal and industrial standards. (Bureau)

- a) Conversion of historical high-high tide (HHT) salinity data to mean tidal cycle (MTC) salinities should be based on Bureau-developed relationships for each station, not on the general Delta-wide conversion used by the Board. (also KCWA)
- b) The pre-project HHT-MTC relationships differ from the with project (current) HHT-MTC relationships, based on work done on the Corps of Engineers physical model of the Delta.
- c) The Board should use Bureau-revised correlations between electrical conductivity (EC), total dissolved solids (TDS), and chlorides (Cl). (also CCCWA)
- d) The Board correlated seasonal Delta outflow with salinity intrusion conditions. A more appropriate method, as detailed by the Bureau for a number of Delta locations, is to correlate monthly Delta outflow with specific historical pre-project salinity conditions.
- e) The consumptive use pattern of Delta crops is not constant, and the Board's time-averaged salinity for the period April 1 - August 15 is not representative of the water quality used by the crops. The monthly salinity values should be weighted according to the monthly crop consumptive use. The Board should use average water quality standards in all years as well as in critical years. Enhancement is still provided to Delta agriculture through umbrella protection.
- f) The Board estimates salinity in critical years at the mouth of Suisun Slough (see Figure V-4 in EIR) to be 75 percent of the Port Chicago salinities. The Board should utilize the Bureau-derived correlations between Pittsburg and Suisun Slough salinities, which give somewhat higher salinity concentrations than those estimated by the Board.

Response: The Bureau's technical evaluation of the Board's methodology in developing standards is detailed, and reflects

a great deal of time and effort in examining some technical gray areas of the standards.

Specific comments related to each proposed "adjustment" are listed below.

a) and b) The proposed conversions rely in part on work done on the Corps model, and interpretation of the results. The Board does not have enough information now to assess this work adequately. However, these suggestions are proper subjects for consideration in future refinement of standards, since station-specific conversions are more technically correct than a single Delta-wide conversion.

c) This proposal concerning correlations between EC, TDS, and Cl also relies in part on Corps modeling work which has not been presented by the Bureau for Board review and analysis.

d) The proposed method correlating Delta outflow with salinity conditions puts much more importance on individual data points than does the method used by the Board. The Bureau's proposal may not be the best approach, given some of the uncertainties of the historical 1922-1944 data.

e) Water is stored in the root zone in varying amounts through the irrigation season, and not necessarily in proportion to monthly plant consumptive use. Even though consumptive use may be higher in mid-summer months, crop salinity tolerance may be lowest during earlier low-consumptive use periods. While

the U. C. Cooperative Extension testimony was directed toward average seasonal soil salinity, some concern was expressed that lower salinity water earlier in the irrigation season might prove beneficial. The limiting factor in understanding irrigation practices and crop responses is the current level of knowledge. Therefore, we believe the current approach is proper and reasonable given the extent of available information. Finally, the Board should not reduce the protection to a beneficial use because enhancement is being incidentally provided to it by the protection provided for another use.

f) The Bureau method for estimating salinity conditions at the mouth of Suisun Slough purports to be an improvement over the method used in the EIR. However, the method used in the EIR was presented at the hearing by Fish and Game (Fish and Game Exhibit 24; RT Vol. XXIII, p. 31), and was not challenged. The Bureau's method relies in part on a correlation based on only one year of actual data at the mouth of Suisun Slough. The acceptance of the Bureau's method would not change (and in fact appears to reinforce) the conclusion in the EIR that CVP and SWP operations have increased salinity in Suisun Marsh during critical years over that under without project conditions.

In addition, it appears that the six enumerated "adjustments" rely to a great extent on information not in the hearing record, stated and unstated assumptions, and interpretation of data

and results related to the Corps of Engineers physical model of the Bay-Delta estuary. Aside from the technical concerns stated above, incorporation of the proposed changes into specific water quality standards would require that information to be subjected to rigorous cross-examination and rebuttal. Since these technical refinements can be more appropriately addressed in the Board's periodic review of standards, there is no need to re-open the hearing at this time to receive additional information. The Board appreciates this information and believes it merits careful consideration during the next review of standards.

Comment: The Department has submitted a method for determining flows past Rio Vista, as required by the Board. (Department)

Response: The method submitted by the Department is adequate at present. However, we expect improvements in Rio Vista flow estimates concomitant with future improvements in Delta outflow estimates.

Comment: The Bureau estimates that the draft plan will reduce exportable yield by 1,100,000 acre-feet while the Department estimates that this reduction is only 40,000 acre-feet. CCCWA understands this difference is due primarily to differences in methodology. If the Bureau has developed data and information using a methodology at variance with that used by the Department, the data and information should be made public. (CCCWA)

Response: We have received detailed comments from both the Department and Bureau regarding the impacts of the draft plan standards on operations of the SWP and CVP. The Bureau and Department differ in their estimates of 1980-level combined firm exportable yield by only 100,000 acre-feet. This difference

is accounted for by differences in assumed 1980-level CVP demands. Were the Department to use the revised CVP demands, we believe that the yields would be essentially the same. However, the projects differ in the estimate of incremental Delta outflow required above their respective base-case assumptions. The Bureau's comments indicate that the standards would require an increase in Delta outflow above their base-case of 900,000 acre-feet per year during the yield determining period, or utilization of 1,100,000 acre-feet in future firm yield when expanded by allowable deficiencies. In effect, this water would come from additional releases of water from upstream reservoirs, which if not required for Delta outflow presumably could be used to satisfy future demands when the CVP expands its delivery facilities and enters into new contracts to deliver more water. There are no basic differences in methodologies used by the Department and Bureau in their 1980-level operations studies, and the difference in the additional Delta outflow required by the standards over each project's base-case is accounted for in the difference in each project's assumed legal responsibilities. In the Bureau's base-case, meeting contractual water quality requirements at the Tracy Pumping Plant is the only water quality standard in the Delta. We believe this falls far short of meeting quality requirements of vested rights and mitigation responsibilities of the CVP. In fact, well over half of the increase in Delta outflow over the Bureau's base-case is attributable to the standards based on the draft Four-Agency Fish and Wildlife Agreement, which the Bureau has helped to develop.

Finally, we have been informed by the Bureau that their detailed comments on the draft plan and Draft EIR have been distributed to a large number of interested parties, including the CCCWA. The Bureau has additional copies available if others wish to evaluate the Bureau comments and methodologies.

VIII. WATER RIGHT PERMITS

Comments: The SWP cannot be responsible for water quality conditions beyond its physical control. Therefore, standards which are not affected by or within control of project operations should not be imposed in SWP water right permits. (Department)

Response: As previously indicated in our response to comments by the Bureau, MWD and SLWD, the Board has determined based on public interest considerations that municipal drinking supplies will be protected to public health levels without regard to the municipalities' vested rights. However, the project operators will not be held responsible for water quality conditions beyond their physical control. Also, with the sole exception of drinking water supplies, the Board will not impose conditions in SWP and CVP permits beyond the effects of the projects on Delta water supplies.

Comments: The standards proposed by the Board can be met if the CVP contributes its share of water for ocean salinity control and for mitigation. (Department)

Response: Operation of SWP and CVP in a coordinated manner will provide the most effective means of meeting Delta water quality standards adopted by the Board. However, the responsibility of the projects in complying with the standards is a joint obligation.

Comment: The Delta Plan should include contingencies in the event U. S. Bureau of Reclamation cannot be made to comply with the plan standards in critically dry years. (OPR)

Response: The creation of such a contingency plan could be contrued as decision by the State that compliance by the Bureau with State developed standards is optional. In the event a critically dry year occurs and the Bureau cannot or will not meet the standards, an emergency plan recognizing the capabilities of the SWP to satisfy standards which would necessarily require lowered Delta water quality standards and decreased diversions by the SWP could be developed in a timely manner. However, our interpretation of the statutes is supported by the recent U. S. Supreme Court decision in California v. United States holding that compliance is mandatory unless there is a clear expression to the contrary by the Congress. We know of no such clear expression by the Congress.

Comment: The draft plan's reference on page VII-4 to the Federal Water Pollution Control Act is disturbing because it implies that the Act invests the Environmental Protection Agency with water right authority. We strongly urge the Board to include a disclaimer in its transmittal of the Delta Plan to EPA that will reserve exclusive State control over all Delta water rights, particularly over those of the State Water Project. (MWD)

Response: The Delta Plan specifically refers to Bureau responsibility for compliance to water quality control plans adopted pursuant to the Federal Water Pollution Control Act. The EPA has no jurisdiction over administration of California water right law.

IX. MONITORING AND SURVEILLANCE PROGRAM

Comment: The description of a more flexible monitoring program directed towards better understanding of the ecosystem and project effects on it, is welcome. (DEAC)

The monitoring program in the draft plan should be changed to reflect that sediment and benthic sampling will be for a short-term study designed to provide information leading to a recommendation for a final program and Board approval by 1979. (Department)

Response: The monitoring program has been modified to incorporate the change recommended by the Department.

Comment: Fish and Game requested at the May 30, 1978 hearing on the draft plan that seven continuous EC recorders be maintained in Suisun Marsh "...to develop and evaluate plans for facilities and to provide background information for future regulations." The Department concurs with the necessity for this monitoring, but suggests that reduced monitoring should follow the development of a hydrodynamic salinity computer model that can be utilized to assess the impact on the Marsh of future development. (Department)

A specific monitoring program is needed for Suisun Marsh. We have recommended seven specific sites to be monitored for electrical conductivity on a continuous basis. In addition, a monitoring station near the western end of Montezuma Slough should be established on an intermittent basis to develop correlations between conductivities there to those at the mouth of Suisun Slough. (Fish and Game)

Response: The monitoring program in the Delta Plan has been modified to reflect Fish and Game's suggestions, but will be reviewed in the future if a satisfactory model can be developed.

Comment: No mention is made of how the recommended studies of the Bay/Delta monitoring program will interact with other studies now going on. The Delta Plan should discuss in detail

the studies which are proposed to determine the freshwater needs of the Bay and the schedule for their implementation and completion. The CVP and SWP should fund these studies. An active study implementation program must be addressed in the plan and EIR. (USFWS)

The draft plan does not discuss the objectives, organization and funding of studies in a comprehensive program needed to determine the effect of Delta outflow surges on San Francisco Bay. The final plan should include more information on how the program will be conducted. (ABAG)

Response: Conditions in their water right permits will require the Department and the Bureau to implement the monitoring program contained in the Delta Plan. The adequacy of recommended programs and any modifications thereto will be monitored closely to ensure that the goals are being attained. Experts from various agencies and disciplines will assist in this review. The draft plan states (p. VII-8), "The Board will assist in seeing that these program activities are coordinated with the activities of other agencies to minimize duplication and to enhance the usefulness of the data collected and study results". In accordance with Section 13163 of the Water Code, the Board will coordinate the water quality related investigations in the Bay/Delta system.

The proposed studies to determine freshwater needs of San Francisco Bay should not be designed by a single agency; they are much too complex and important for such treatment. However, the Board will act as a catalyst by bringing expertise from various state and federal agencies together with

academic advisors to design a program that will answer specific questions about San Francisco Bay. This program will be designed by June 1979 and will be in operation by the fall of that year.

The completion date for this program will, of course, depend on the questions to be answered, but it does not appear that such a program can be completed in less than five years.

Comment: The Department is participating in a joint program with the Board, the U. S. Geological Survey and the Bureau which may lead to the direct measurement of Delta outflow. Work is also being done to improve outflow estimates, based on data collected in 1976 and 1977. Due to the complexities of the Delta, program outputs are not expected until the spring of 1980. (Department)

Response: Improvements in actual Delta outflow determinations are necessary for measuring compliance with Board standards as well as for day-to-day operations of the CVP and SWP. The Board is hopeful that efforts to improve these determinations will be fruitful. Research to determine Delta channel depletions is also important. This information will provide additional benefits to Department and Bureau modeling programs for the Delta.

Comment: The Delta Outflow Index contains apparent errors during much of the year since historical data does not show a uniform month-to-month outflow/salinity correlation. Corrections are offered to the Outflow Index, based on evaluation of historical data and presumed changes in channel depletions during late summer months of critical years. (Bureau)

Response: The Bureau's effort to improve the current estimates of Delta outflow is consistent with our requirement in Chapter VII of the Delta Plan that the accuracy of Delta outflow estimates be improved. However, the Bureau does not provide the technical basis for the suggested Outflow Index adjustments, nor are assumptions on Delta consumptive use patterns presented in sufficient detail. All of this information should be presented to and considered by the Board in the next periodic review of standards. The projects should work in the near future with the Board staff and other agencies to evaluate any suggestions for improvement in Delta outflow determination.

X. DRAFT EIR

A. Alternatives

Comment: The impacts of utilizing 1.9 EC_e as the threshold salinity tolerance level for corn should have been included in the assessment of alternatives. These impacts include possible crop yield decrements in the Delta, impacts on the Delta environment, impacts on project yield, and impacts on project service area environment. (Department)

Response: The determination of agricultural needs in the Delta Plan is based in part on utilizing 1.7 EC_e as the threshold salinity tolerance level for corn. This is the best supportable value on the basis of current knowledge of the needs of Delta agriculture. Alternatives based on presumed higher salinity tolerances, in the absence of better technical data, would probably infringe on Delta vested rights, an alternative not open to the Board. Further research is the key to quantifying more precisely the salinity requirements of Delta agriculture.

Comment: The EIR should evaluate the alternative of protecting water quality only at the SWP and CVP export pumps, to levels specified in the water service contracts. This evaluation is necessary for full compliance with the requirements of CEQA. (Department, MWD)

The "no action" alternative with respect to the CVP should be compliance with the November 19, 1965 criteria, Bureau contractual obligations, and Bureau legal obligations under the permits and licenses issued to the United States. (CVESPA, TLBWSD, KCWA)

Other alternatives should have been considered also, such as operation under water right decisions D 1275 and D 1291, fish flows other than those set forth in the Four-Agency Fish and Wildlife Agreement, and other operations which were suggested during the hearing. The "no action" alternative of the existing basin plan is an unfair comparison, since the basin plan is so adverse to economic uses of water that no reasonable alternative to that plan could have been worse. (KCWA)

The EIR should evaluate the alternative of the CVP not providing its share of outflow necessary to meet Delta standards.
(Department)

A complete description of pre-project conditions is necessary in order to have a basis against which to compare each of the other alternative plans. (CDWA)

Response: Most of the alternatives suggested in these comments are not evaluated in the EIR because they would not protect vested water rights nor mitigate impacts of the projects. CEQA does not require that an EIR evaluate alternatives that are contrary to state law.

A comparison of the Delta Plan standards with a set of Delta water quality criteria, other than that of the existing basin plans, as a "no action" alternative would be meaningless. If the CVP were exempt from compliance with existing Board adopted standards or with Board conditions in permits, then it would also be exempt from compliance with the standards of the Delta Plan. Thus, any comparisons would be moot insofar as impacts on the federal project are concerned. If the CVP is subject to either Board conditions in water right permits or standards established in water quality control plans, as the Board believes it is, then the "no action" alternative used in the EIR is proper.

The EIR and Delta Plan encompass a wide spectrum of alternatives which are within the Board's authority for consideration. As discussed in Chapter V of the plan, alternative fish flows other than those of the Four-Agency Agreement were also considered.

Chapter VII of the plan indicates that future changes in fish and wildlife standards are possible as additional information is obtained on the needs of the estuary. Finally, the proposal of other alternatives using operations suggested during the hearing is non-specific. The Board believes that an adequate range of alternatives has been already considered.

The pre-project condition is not one of the alternatives which the Board considered. Therefore, a complete description of that condition is not necessary. However, a description of the salinity intrusions during the pre-project period is discussed in Chapter III of the EIR. This discussion is used to arrive at certain conclusions regarding vested water rights and salinity conditions which actually existed during the pre-project period.

B. Impacts

Comment: Omission from the EIR of the effects of local agricultural return flows is inappropriate, and has caused improper assumptions to be made concerning without project conditions in areas of the Delta downstream from the San Joaquin and Mokelumne Rivers. Standards for interior Delta stations do not consider the effects of land-derived salinity. (Department)

Response: The effects of land-derived salts were considered only to the extent that such effects contributed to pre-project historical Delta salinity data. The detailed effects of local agricultural return flows in Delta channels cannot be evaluated without development of a good salinity model for the interior Delta. The Department, the Bureau, the Board and others have

worked to improve modeling in this area for more than ten years, and still an adequate model has not been developed. Future consideration of the problems associated with agricultural return flows will depend on ongoing nonpoint source pollution control programs, drainage problems, and assessment of the responsibilities of all water users in the basins tributary to the Delta.

Comment: The Bureau contractual commitment for water quality maintenance requires less outflow than that needed to meet SWP contractual commitments. Therefore, the projects are looking at different "base cases". The combined firm exportable yield from 1980-level analyses is about the same under both the Department and Bureau operation studies (5.8 million acre-feet and 5.7 million acre-feet, respectively). However, the additional water above the Bureau's base case required to meet the proposed standards and achieve the indicated yield must come from additional depletion of upstream storage. The additional use of upstream storage to meet the standards through the 1928-1934 dry period (one million acre-feet per year average increase in use of upstream storage) causes the Bureau great concern. The sharing by the projects of this burden is based on the annual Coordinated Operations Agreement, which puts a disproportionate share of the burden on the CVP. The relative SWP/CVP shares should be renegotiated so that the burden is based on separate project impacts on the Delta. (Bureau)

Response: The effect on combined firm exportable yield is not the only impact of the standards on the CVP and SWP, but it is a measure of the projects' abilities to satisfy contractual commitments under sustained drought conditions. The responsibility for meeting standards is a joint responsibility of the projects. The relative SWP/CVP share of this burden is a matter to be resolved between the Department and Bureau through a coordinated operations agreement. In this context, the Department has indicated a willingness to adjust the coordinated operations agreement to avoid allocating any disproportionate burden on the CVP.

Comment: The EIR fails to fully describe the SWP and CVP service area needs and fails to assess fully the impacts, environmental, social and particularly economic, of the plan and alternatives to it in the export areas. (KCWA, CVESPA, TLBWSD)

Response: The plan slightly increases firm export yield over the "no action" alternative of the basin plans and Decision D 1275 as amended by D 1291. Thus, the plan cannot be considered as having any significant adverse economic or social impacts in the projects' service areas. We believe sufficient information concerning the exporter's commitments, and alternatives to the plan which could feasibly attain its objectives, have been evaluated. Potential environmental impacts are discussed adequately in the EIR and in the response to the following comment.

Comment: The impacts of the plan on all beneficial uses in the areas of origin, as well as in the export areas, must be evaluated. Rare and endangered species, such as the blunt-nosed leopard lizard and the San Joaquin kit fox are directly threatened in the export area as a result of water development by the CVP and SWP. (USFWS)

The EIR should provide an assessment of the environmental impacts that "firmed up" water supplies may have in the San Joaquin Valley, particularly in causing increased groundwater overdraft. (OPR)

The "growth inducing impact" resulting from the projects is not discussed adequately. The exporters' commitments are accepted without adequate discussion. (CDWA)

Response: The EIR adequately addresses the adverse impacts of the plan on beneficial uses in the Bay-Delta estuary and the export service area. Impacts are considered in terms of alterations of the environment attributable to the proposed action as compared to the conditions that would exist if no action were taken. If the Board took no action, the existing basin plans

for San Francisco Bay Basin 2 and Sacramento-San Joaquin Delta Basin 5B, and Decision D 1275, as amended by D 1291, would be controlling. These current salinity standards and the operations of the CVP and SWP comprise the "no action" alternative against which environmental effects of the Delta Plan have been assessed.

General public acceptance has been already given and commitments have been made by the State through passage of a statewide bond issue, the California Water Resources Development Bond Act (Burns-Porter Act), to finance the SWP. Also, the State has executed water supply contracts to serve areas in both northern and southern California in which over 14 million people live. The MWD contract, the first of the water supply contracts executed, was validated by the California Supreme Court.

The Department and the Bureau believe themselves obligated to fulfill their contractual obligations for water supply in the export service areas. Existing facilities may not meet all contracted and anticipated needs in the CVP and SWP service areas. The Department and Bureau are currently investigating additional facilities and programs to meet these needs. The Delta Plan does not increase the basic allocation of water to the CVP and SWP made in the Board's previous decisions which approved the water right applications for those projects. Although the Delta Plan may allow a small increase in firm dry period export yield

under the existing allocations, it should be kept in mind that the projects would have developed other means to satisfy demands in the event this increased yield were not available. However, the anticipated increase in export yield as a result of the plan accounts for less than one year's increase in SWP contractual demands. In view of this, the plan cannot be considered as having any growth inducing impact, nor adverse impacts on fish, wildlife and groundwater overdraft in the projects' service areas.

Comment: No effort is made in the Draft EIR to spell out and describe the impacts to western Delta agriculture of relaxing agricultural standards in dry and critical years. (CCCWA)

Response: The agricultural standards for the western Delta are based on agricultural needs as limited by vested water rights, and thus provide protection to Delta agriculture that would exist had the SWP and CVP not been built. The "no action" agricultural standards provided substantially less protection in all years than that provided by the standards of the Delta Plan. The impacts on western Delta agriculture are addressed in the EIR.

Comment: Neither the plan nor EIR indicates if the Delta Plan water quality standards will result in additional energy consumption by the State Water Project. (OPR)

The EIR does not discuss energy related impacts. (CDWA)

Response: Energy related impacts are mentioned at the end of Chapter VII of the EIR. The Delta Plan does not increase the basic rights of the SWP and CVP to divert water from the Delta. Whether the plan would result in a net increase in energy consumption depends upon alternative operational schemes which might

be used by the project operators to meet the service area needs if the salinity standards of the existing basin plans remained in effect. Although the plan increases the capabilities of the projects to divert from the Delta to the extent of 160,000 acre-feet per annum during the yield determining dry period (1928-1934), it also allows maintenance of greater quantities of water in storage in upstream reservoirs which would allow more flexibility and more efficient use of hydroelectric generating facilities than would be the case in a dry period under the "no action" alternative. Sufficient information on alternative operations of the projects is not available to allow quantification of these energy factors.

Comment: The EIR does not indicate if the standards of the Delta Plan will result in additional scouring of Delta channels. (OPR)

Response: Scouring is dependent on channel velocities and on diversion rates, rather than quantity of water diverted. The plan does not increase the maximum diversion rate from the Delta. Any increase in firm yield resulting from the plan is due to availability for diversion of more water than in the basin plan during dry and critical years at times when diversion is generally less than maximum rates.

Comment: The EIR should determine if the Delta Plan standards will increase flow reversal problems in the southern Delta. (OPR)

Response: Under either the "no action" alternative (basin plans) or the Delta Plan, project exports will continue to increase. To the extent that water quality standards are satisfied and the

projects have the capability of increasing exports and export rates, the flow reversal problems in the southern Delta are likely to continue to increase as long as the present method of export diversion remains unchanged. However, reverse flows will be less pronounced under the Delta Plan than under the "no action" alternative except in critical years. This would occur under the Delta Plan because of the shift of high exports (rates) to earlier in the year when high outflows are available.

Comment: The adverse impact that water development has had on fish and wildlife in the Bay/Delta-Central Valley drainage system needs further discussion in the plan and EIR. Fisheries dependent on this system have seriously declined with upstream water development and exports of large quantities of water from the Delta. Fall and winter production flows and the spring distribution flows have been reduced. Summer flows have been sustained at higher levels. When modified summer flows, which are somewhat beneficial, are reduced to the low historical levels, as happened in 1977, the resources are exposed to the worst conditions possible. The draft plan allows the naturally high wet weather flows to be reduced and flows during normal low-flow periods to be maintained at or below their natural low-flow level. The draft plan allows for less water in dry and critical years than the previous basin plan. The Delta Plan assumes that higher water flows in wetter years will make up for the losses in drier years. Such a process continues to gamble with these resources to allow more water to be exported. (USFWS)

Response: The geographic scope of the Delta Plan and accompanying water right decision is the Delta and Suisun Marsh with policy guidance on San Francisco Bay. The Board does not have authority under this proceeding to "right all of the wrongs" that water development may have caused to the Bay/Delta/Central Valley fishery. The Board's jurisdiction in this proceeding is limited to reservations of jurisdiction related to salinity control in the Delta in

permits of the Department and the Bureau. Right or wrong, past decisions on water development have been made. The CVP and SWP have been constructed and are in operation. Numerous upstream reservoirs trap historic wet weather flows for power and irrigation needs. Figure V-7(a) of the EIR shows that these developments have reduced wet weather Delta outflow.

This is the set stage from which we are working. The figure also shows that the Delta Plan will not appreciably alter current wet weather flows.

During the low flow portion of the year, the Delta Plan typically results in higher flows than the basin plans. The exception is in critical years. The summer flows provided in critical years are not at or below their natural low-flow levels as alleged by the USFWS, but substantially greater. Figure III-31(a) graphically demonstrates this..

The net effect of changes in flow from the basin plans to the Delta Plan for one fish species, striped bass, is shown on Table V-1 in the EIR. Under the Delta Plan conditions for striped bass will be much better in wetter years and lower in critical years. Further, according to the best scientific data available, conditions on the average for striped bass will be much better under the Delta Plan than the basin plans. If this is a gamble it is the same gamble with which these resources have evolved. Estuaries

are harsh environments where those organisms that do well have developed survival mechanisms to exploit good environmental conditions and survive bad conditions. While conditions that directly affect striped bass survival under the Delta Plan will not be as good as they would have been naturally during wetter years, conditions during drier years will be better.

Concerning environmental conditions during the summer of 1977 two points should be made. First, the best available information leads us to the conclusion that the factor limiting general estuary productivity in 1977 was the abnormally low winter outflow, not the summer outflow. The Board is concerned that there be sufficient winter flows to ensure estuary production. This concern is highlighted in the phytoplankton section of the EIR and incorporated in the policy guidance contained in Chapter VII of the plan. Second, the conditions that led to the emergency action taken by the Board in 1977 to conserve Delta water supplies, and the low outflows that year, were due in part to high outflows required in 1976 (the first year of the drought) by the basin plan standards which had no critical year relaxation provisions for fish and wildlife standards. The Delta Plan will allow conservation of additional supplies upstream of the Delta in critical years, thus ensuring better protection during extended droughts. This will help to avoid a recurrence of the no option situation during the 1976-77 drought.

Comment: Fish and Game presented information that the established relationship between outflow, diversions and young striped bass abundance seriously miscalculated the actual fishery abundance in 1977. Discussion of this important information appears only once in the Draft EIR on page I-6. The EIR must more fully discuss this information and disclose the plan's possible adverse impact in this area (CDWA).

Response: The information alluded to is discussed in detail in Chapter III of the EIR and is also addressed in Chapter VII under potentially significant impacts. Also, the Delta Plan sets forth policy guidance on this issue as a major concern.

Comment: The Draft EIR does not completely describe the consequences of less than complete protection for the Marsh. The recommended plan will have an adverse impact on waterfowl food production. The consequence of this must be described more fully. (CDWA)

Response: On pages 8 and 9 of the Draft EIR the impacts to the Marsh of the recommended plan are compared to the impacts of the "no action" alternative. Near-term differences in impacts on the Marsh between the two alternatives are minimal. When the benefits to be provided by the initial Marsh facilities are included, the Delta Plan results in a significant environmental improvement over the "no action" alternative. Modifications to the Delta Plan have further increased interim Marsh protection. CEQA requires a comparison of the "no action" alternative (Alternative IB) with the recommended plan. This comparison is included in the EIR.

Comment: The term "without project conditions" really first surfaced in the Board's recommended plan. The conclusions drawn from it are based on scanty evidence. A much more thorough discussion of how these adjustments to the historical record were made is required in the EIR. We disagree with some of the many assumptions made in this analysis. The effect of without project conditions needs to be identified for each beneficial use. (CDWA)

Response: The term "without project conditions" and basic data used in its development were presented by the Department in their Exhibit II-12. This exhibit is controversial and certain general assumptions were made in its development. However, the exhibit was subjected to extensive cross-examination during the hearing and was the subject of many meetings and analyses since that time. Although refinements can and should be made, the information is useful in identifying without project conditions for each major use.

Each use has been looked at separately in determining the level of protection it would have had under without project conditions. The approach used in the analysis for each is discussed in the EIR. The basic approach was presented by the Board at the opening of the Phase II hearing, which is referenced in the EIR. Also, the details of the approach have been explained not only to the Central Delta Water Agency but also to most (if not all) of the interested parties in separate briefings. A more detailed technical discussion in the EIR is not warranted.

Comment: The Draft EIR states on page III-3 that "seawater" penetrated the Delta historically in late summer of drier years. This wrongly implies that water of ocean salinity intruded into the Delta. Are the ratios of Sacramento River inflow to San Joaquin River and minor tributary inflow on page III-7 of the Draft EIR based on pre-project conditions, post-project conditions, or both? This is significant as it relates to Figure III-6 concerning "...more rapid salinity intrusion and flow reversal in the San Joaquin River portion of the Delta, and subsequent

slower recovery to net downstream flow conditions" (Draft EIR, p. III-20), which conclusion cannot be readily drawn from Figure III-6. Also, the use of the term "late spring" in the discussion commencing on page III-21 is imprecise: "Generally salinity over the last 30 years from late spring through the summer has been somewhat less than would have occurred without the effects of reservoir regulation, depletion and export." NDWA and CDWA testimony challenges this statement, and can be used to pinpoint the precise time of the year when this change occurred. (CDWA)

Response: The wording referred to on page III-3 of the Draft EIR has been changed to reflect the historical conditions of salinity incursion, and not "seawater" penetration. Wording on page III-7 of the Draft EIR has been changed to describe the ratios of inflow from the Sacramento and San Joaquin Rivers as pre-project (1922-1944). The post-project ratios (1945-1971) have been added. The last two sentences on page III-20 of the Draft EIR, which include the referenced statement, have been deleted. Finally, "from late spring through the summer" has been changed to "through much of the summer". The discussion is general in nature, so does not require the degree of precision suggested by CDWA. The time of change in salinity conditions would be unique for each year's hydrology.

Comment: The EIR does not discuss the failure of the CVP and SWP to reduce or eliminate groundwater overdrafting within the service area. (CDWA)

Response: The EIR responded to impacts which would result from the Delta Plan or the alternatives to it. The groundwater overdrafting in the CVP and SWP service area is beyond the scope of the Delta Plan.

Comment: A distinction is needed between winter leaching and winter flooding. (CDWA)

Response: The difference between "winter leaching" and "winter flooding" was recognized in the preparation of the EIR. The distinction between the two is clear in the hearing record. As testimony shows, winter leaching is more successful than winter flooding in the control of salts, and involves greater expense. The hearing records shows that some islands with organic soils on which potatoes are grown are leached every winter while on some islands where corn or milo is grown the leaching frequency is once every two or three years (RT Vol. III, p. 47). The testimony also infers that the growers who practice winter leaching have developed good management practices and that winter leaching helps them stay within salinity tolerances for these crops.

Comment: The increasing suburban encroachment in the Delta has competed and will continue to compete economically for agricultural land. High value specialty crops are the last resort of a farmer threatened by high taxes and suburban encroachment, and the setting of standards of water quality based on the salinity tolerance of corn removes that alternative. Thus, the impact of suburban encroachment due to precluding options for the farmer should be discussed in the Final EIR. (FOR)

Response: The Board shares concerns about the state-wide problem of suburban encroachment on productive agricultural lands. However, we are not aware of any evidence that substantial suburban encroachment exists in the Delta, probably due to limited access, unstable soil conditions, risk of levee failures, lack of adequate domestic water supplies, poor potential for adequate wastewater treatment and disposal, and other limiting conditions. Protection of corn will also protect a wide variety of other crops, since corn is relatively salt sensitive.

Comment: If Delta water quality is to be the ultimate reason for filling New Melones Reservoir or constructing other new projects, then the impacts to the environments of these project sites need to be considered in the Final EIR of this plan. (FOR)

Response: The Delta Plan does not require or mandate construction of any new upstream storage facilities for compliance with Delta or Suisun Marsh water quality standards. Water from New Melones Reservoir to meet the interim standards at Vernalis will be provided as the result of an agreement between the Bureau and the Central Valley Regional Board. This agreement predates the Delta Plan, and will not be a part of the Board's water right decision in this matter. Finally, any proposed new water development project must stand on its own merits, and its sponsors must disclose its own environmental consequences.

Comment: The draft plan includes a provision for relaxation of striped bass spawning flows proportional to deficiencies in deliveries of project water. The impacts of this provision are not discussed in either the draft plan or the Draft EIR. The quantities of water are not stated. (FOR)

Response: The impacts of the relaxation of the striped bass spawning standard are discussed in the Draft EIR on pages V-15 to V-18, in the striped bass spawning portion of Table V-1 of the Draft EIR and in corresponding sections of the Final EIR. The project deficiencies related to the relaxation are set forth in Table VII-1 of the Delta Plan under the striped bass spawning standards.

Comment: Minimum flow standards at Rio Vista, below the proposed Peripheral Canal diversion point, are not advisable at this time. There are important unexplored relationships between internal Delta flows, water temperature and biostimulation which must be explored before flow standards are established. (County of Sacramento and Region 5)

Response: The flow standards at Rio Vista are explicitly "minimum suitable flows for salmon migration" as recommended by Fish and Game. They are not based on the specific concerns of the County or the Regional Board. The Delta Plan only supersedes the standards of the basin plans to the extent of any conflict. The plan will not alter the water quality objectives for temperature and biostimulation contained in the basin plans. However, the concerns raised are valid. The Board concurs that more study is needed to adopt flow standards that address these needs. As information becomes available on these needs the Board will modify water quality standards to reflect this information.

Comment: A description of Delta farm management and marketing practices and capabilities should be added to the EIR. (MWD)

Response: Chapter III of the EIR describes the method of irrigation used in Delta organic soils and the management practices related to this. Since agricultural standards are based on quality needs of Delta agriculture with current irrigation practices, we believe the plan would have no significant impact on farm management and marketing practices and capabilities.

C. Specific Comments

Comments: The statement at the bottom of page I-2 of the Draft EIR, "The recommended plan would provide the same level of protection to beneficial uses that would have been available to the Delta in the absence of the SWP and CVP", is untrue. (DEAC)

Response: The statement has been rewritten as follows:

The recommended plan would provide the same level of protection to agricultural, municipal, and industrial uses that would have been available to these uses in the absence of the SWP and CVP.

In addition, the survival of young striped bass would approach without project levels and project operators would be required to mitigate impacts of the projects on Suisun Marsh by October 1, 1984.

Comment: The last paragraph on page I-3 of the Draft EIR which states, "The overall protection under the recommended plan, while requiring less freshwater outflow in water short years, would be greater than would result if the Board took no action", is in line with the Board's staff contention that the Delta Plan will protect the environment better than the basin plan. This contention depends upon the erroneous use of the June/July out-flow correlation with young-of-the-year striped bass which Fish and Game as labeled as a misunderstanding of their evidence, and upon the assumption that the basin plan objectives of maintaining net positive downstream flows in all Delta channels is not enforceable. If that contention is made, the numerous assumptions required to make it must be described. (DEAC)

Response: Fish and Game has not labeled the Board's use of their flow/bass relationships in determining impacts as a misunderstanding of their evidence. They did express some concern about our estimates of without project conditions in their comments, but have not adversely commented on our use of their information in comparing the basin plan to the proposed plan. In fact, DEAC's own comments on the EIR recognize use of this tool to help evaluate the various plans when its limitations are acknowledged.

Further, the Board's use of the flow/bass survival equations in comparing the basin plan to the recommended plan is similar to that in Fish and Game Exhibit 16. That exhibit predicts the striped bass survival at the 1980 level of development based on the Department's 1980 operation study.

In the final EIR the estimates of young bass survival under the recommended plan have been modified in accordance with more

accurate operation studies. Under the recommended plan, the long-term survival is expected to be 79 as compared to 63 under the basin plan.

The positive net downstream flow objectives for all Delta channels contained in the basin plan was intended only as a goal to strive toward. Achievement of such conditions would require virtual elimination of exports from the southern Delta. To enforce such a goal as a standard at this time is not in the public interest. Thus, this basin plan condition was not enforceable. However, it is still an appropriate goal. Chapter VII of the plan addresses the desirability of achieving this goal.

Comment: The sentence on page I-7 of the Draft EIR, "Thus the potential of a significant environmental impact is considered remote", should be removed. (DEAC)

Response: The Suisun Marsh interim standards have been modified to provide a 28-day mean salinity at Chipps Island no greater than 12.5 mmhos EC during the period January through May in all years. Because of this, the plan will have no potential adverse effect on upper estuary productivity.

Comment: The second paragraph on page I-8 of the Draft EIR referring to Suisun Marsh says, "The Plan requires an intermediate level of protection and actions to ensure that adverse impacts sustained by the Marsh prior to 1982 are at least partially mitigated". This statement is also true for the standards designed to protect fish. (DEAC)

Response: In a general sense, DEAC is correct.

Comment: The second paragraph on page II-3 of the Draft EIR which states, "Experience in implementing the salinity objectives in the basin plans and Board water right decisions and information developed since their adoption, have made it apparent that the salinity objectives must be revised", could be profitably expanded to explain why that is true. (DEAC)

Response: After conducting over 30 days of evidentiary hearing on the Delta and Suisun Marsh it is evident that pertinent information essential to the development of water quality standards for the Delta and Marsh has greatly increased over the last decade.

The Delta standards have been modified to reflect this new information. Secondly, Delta standards must be enforceable on the CVP and SWP in order to ensure compliance. Many of the basin plan Delta standards were merely planning objectives -- appropriate to provide guidance and future direction, but lacking present day enforceability. The Delta Plan sets realistic standards on CVP and SWP operation that are enforceable. It also distinguishes these standards from policy guidance designed to inform the projects and the public as to the factors which must be considered for Bay/Delta protection in planning for future facilities.

Comment: On page III-23 of the Draft EIR the description of the project exports would provide the reader with a better understanding if a table were added describing the total annual exports of both the SWP and CVP since each began, along with a description of how each project has historically exported different amounts during different seasons. Reverse flow conditions that occurred prior to 1967 should also be highlighted. (DEAC)

Response: The Final EIR has been modified to incorporate reference to reverse flow conditions prior to 1967. A more extensive discussion of historical export rates is not necessary.

Comment: The paragraph on page III-35 of the Draft EIR describing factors other than salinity and the volume of flow affected by this project should include a description of how flow reversals and increased net flows through Delta channels will be affected by the increased exports under the plan. (DEAC)

Response: The EIR section on analysis of impact has been modified to show the expected changes in export rates during the year as a result of this plan and the possible effects of such changes.

Comment: The sentence at the bottom of the first paragraph on page III-70 of the Draft EIR, "Recent work by Fish and Game found that May exports can be increased to the extent that a May/June relationship for survival versus flow and export, more closely explains the interaction of these parameters than the June/July relationship", would better explain the situation if it read something like the following:

"The Department of Fish and Game has found that since May exports have been increased, the variations in the population size of young-of-the-year striped bass are not as well correlated with June/July outflows as they are with May/June outflows." (DEAC)

Response: We have reviewed the information presented by Fish and Game and believe that the May/June relationship likely controls when May flows are low and/or export rates are high. At very high May Delta outflows, the effects of high exports are uncertain. Therefore, the sentence in the EIR is believed to more accurately reflect the current state of knowledge than the DEAC suggestion.

Comment: The statement on page III-71 of the Draft EIR that bass washed out into San Pablo and San Francisco Bays survive to be recruited into the adult population is weakly supported with data. We have no objection to it as a hypothesis, but the fact is no one knows what happens to those bass. (DEAC)

Response: The EIR restates Fish and Game's testimony. This information, cross-examined during the hearing, was used by Fish and Game in development of the proposed striped bass standards in their Exhibit 11, as shown on their Exhibits 14 and 15. In addition, Board staff has reviewed the technical paper by Donald Stevens (Transactions of the American Fishery Society, Vol. 106, No. 1, 1977) from which this theory was derived. While remaining a theory, it is compelling enough to be included in the EIR.

Comment: The last paragraph on page III-71 of the Draft EIR, "Provided adequate environmental conditions exist in May, the total striped bass index expected to occur in the Estuary can be calculated from environmental conditions in June and July by summing the results of the equations found in Figures III-27 and III-29", requires an assumption that all other factors affecting the young striped bass will not change. That is a major assumption which should be named and justified. (DEAC)

Response: Under the scope of the plan, this assumption is not a major one. This would be an important assumption if the plan dealt with additional facilities or modifications to the Delta. The statement has been revised, however, to reflect that conditions in May and earlier in the year must be adequate in order to substantiate this statement.

Comment: Figure III-27 of the Draft EIR shows that in recent years the actual Striped Bass Index has usually been much lower than that predicted using the June/July outflows and diversions. Doesn't this refute the paragraph commented on above? (DEAC)

Response: No. Figure III-27 merely reinforces the conclusions on factors affecting bass survival. Fish and Game showed that the factors most affecting bass survival recently were the May/June conditions. In recent years May conditions have evidently been limiting.

Comment: In regard to salmon and steelhead, the last paragraph on page III-76 of the Draft EIR says, "In any event, past projects have so altered these populations that one can no longer address the environmental needs of the historical populations." We suggest that be changed to something like: "In any event, past projects have so altered these populations that it seems academic to address the environmental needs of the historic populations." (DEAC)

Response: This suggestion has been incorporated into the Final EIR.

Comment: The description and conclusions on Draft EIR pages III-81 and 82 which are related to Sacramento River flow and young salmon survival need to be carefully revised. (DEAC)

Response: This section has been rewritten in the Final EIR.

Comment: The first full paragraph on page III-83 of the Draft EIR conveys to the reader that Fish and Game's recommended diversion curtailments and methods of operation will by themselves be adequate to protect salmon and steelhead. This is not true. Higher flows beyond these minimum flows are needed. The paragraph should also reflect that the recommended operational constraints were the best that Fish and Game could negotiate with the Department in five years of effort and are not necessarily adequate to protect the salmon and steelhead. (DEAC)

Response: The paragraph has been reworded to reflect that the flows are "minimum satisfactory flows for salmon" (as stated by Fish and Game) and that higher flows provide benefits beyond this minimum. The Draft EIR states that export curtailments and other operational constraints are intended to help minimize, not eliminate, the diversion of salmonids from the Delta. The term "adequate" is not used anywhere in this paragraph.

Comment: Page III-101 of the Draft EIR refers to proposed water quality schedules in the managed Marsh and alkali bulrush seed production. Revisions should be made reflecting that many of the clubs do not have the facilities to make efficient use of water that will be required by these proposed water quality schedules. (DEAC)

Response: The Board is aware that current facilities are not adequate to operate to the proposed water quality schedules. The first sentence of the paragraph in question states, "Assuming that adequate management facilities would be available in each duck club, Fish and Game proposed a water quality schedule ..." (emphasis added).

Comment: In the description of Suisun Marsh (Draft EIR pp. III-95 to 101) and the effect of varying salinity on it, we find no description of the problem that reduced freshwater outflow is making management of the Marsh behind levees more and more difficult and is discouraging the plants which are more beneficial to waterfowl in the leveed areas. This should be clearly written somewhere here. (DEAC)

Response: This section has been rewritten to make this problem clearer.

Comment: The extent of riparian habitat in Suisun Marsh should be more clearly defined. (DEAC)

Response: The discussion of salinity requirements of the unmanaged wetlands (Draft EIR, pp. III-107 to 110) has been revised to make reference to Figure III-12 which graphically shows the extent and location of tidal areas and the location of Eucalyptus trees.

Comment: We question the conclusion at the end of page III-110 of the Draft EIR that "The Board believes that sufficient netting has been done by Fish and Game in the Suisun Marsh area to be reasonably sure that this species (the thicktail chub) no longer exists in the Marsh." Fish and Game's netting in the Marsh has been primarily with gill nets and by trawling in the open water of the channel. Trawling gear could not be expected to take the thicktail chub except by accident. We think the conclusion is unwarranted. The EIR must describe the extent of the search which failed to turn it up so the reader can judge the validity of the conclusion. (DEAC)

Response: This statement refers to the extensive netting done by Fish and Game in the collection of young-of-the-year striped bass and Neomysis, and to recent work on young salmon. We have conferred with Harold K. Chadwick of Fish and Game. He believes it is reasonable to assume that some thicktail chub would have been captured if indeed they were present in these portions of the estuary. In addition, the Resources Agency publication entitled The Crossroads, 1976, A Report on California's Endangered and Rare Fish and Wildlife on page 36 states in regard to the thicktail chub: "The last known specimen was collected in 1957 from Steamboat Slough in the Sacramento River Delta. It may be extinct now, since it has not been identified in extensive fish collections made throughout the

Sacramento-San Joaquin Delta, and at the fish collection facilities of the Bureau of Reclamation and Department of Water Resources pumping plants. Draining of riparian marshes, together with diking, channelization, and other flood control measures are largely responsible for loss of habitat. Predation by exotic game fishes may have contributed to decline, also."

Comment: The last sentence of the first full paragraph (Draft EIR page III-121), "Further study is needed to identify more closely the effects Delta outflow has on the biology of San Francisco Bay", should be followed with a good description of the major reductions in unregulated outflows predicted to occur during the life of this plan and beyond, and a statement that some reservation of remaining unregulated outflows should be made until the investigations determine how much is necessary for protection of the Estuary. (DEAC)

Response: The referenced discussion has been modified to include hydrographs for typical year types. These hydrographs show that major reductions in unregulated flows will not occur as a result of this plan beyond the reductions which would occur under the existing basin plan. Therefore, no reservation of flows is needed at this time. The Board will establish outflows needed for San Francisco Bay as better information becomes available on the needs of the Bay. A policy statement to this effect is set forth in Chapter VII of the Delta Plan.

Comment: In describing the Central Valley Project supply and demand, the first paragraph on page III-168 of the Draft EIR states, "However, as shown by Table III-9, the future demand is expected to exceed the yield with presently existing facilities. Therefore, if projected future demand is to be met, additional

facilities must be constructed." According to Table III-9, the 1980 CVP supply with existing facilities is 10.7 MAF, and this demand will not reach that figure until the year 2000. That is what the text should point out.

The estimates of "Possible Delta export demand for the year 2000" are described in the last paragraph on page III-169 of the Draft EIR as ranging from 6.2 MAF to 10 MAF annually. This should be reconciled with Table III-9, which indicates that the CVP demand alone in the year 2000 will be 10.7 MAF annually. It would also be useful if a table similar to III-9, but showing the State Water Project demand and supplies, was shown and if there was some description of how new facilities, especially additional export pumps and a Delta transfer facility, would affect the available export supply.

If the total CVP supply is 10.7 MAF, without any additional facilities as shown on Table III-9, why does the last paragraph on page III-171 of the Draft EIR say that meeting expected Delta export demands of the CVP and the SWP involves "increasing storage capacity, changing operating criteria, amending export contracts, providing alternative supplies to Delta users, improving efficiency of the cross Delta transfer of water, or some combination of those options"? (DEAC)

The Plan and EIR should fully disclose the inadequacies of the SWP with respect to yield and meeting of contracts in the early 1980's. (Sierra Club)

Response: The CVP supply shown in Table III-9, page III-168 of the Draft EIR represents the supply upstream of the Delta, and not the capability for export. The CVP has developed most of its potential supply, but is limited by its physical facilities in exporting this supply to its areas of need south of the Delta. While demand will not exceed supply until some time after the year 2000, the CVP may not be able to meet this demand unless additional conveyance facilities are constructed. However, this assumes that the demand will be as projected in Table III-9 and will be satisfied. This answers the concerns regarding the comments on page III-171

of the Draft EIR as well. The footnote to Table III-9 indicates that the Bureau assumes the existence of additional project facilities after 1980.

The purpose of Figure III-41, upon which the statement on page III-169 is based, is to show that estimates of future Delta export demands vary widely. These estimates are based on various forecasts of changes in population growth rates, new facilities, the effect of reclamation and conservation, and possible future programs to expand agricultural production and/or overcome existing groundwater overdraft problems. The year 2000 CVP demand of 10.7 million acre-feet shown on Table III-9 represents demands for the entire CVP service area, not just the Delta export service area demands accounted for in Figure III-41. Bureau Exhibit 64, pp. 8-11, indicates that the demand figures also include a substantial amount of prior vested right water, which the Bureau is obliged to furnish prior to delivery of contract water (this water is assigned primarily to upstream riparian users). Therefore, the information in Table III-9 and the referenced statement on page III-169 are not in conflict.

Finally, the EIR has been revised to include a table showing existing SWP supply, and the projected future buildup in SWP demands. It is uncertain how new project facilities would

affect available export supply, since it is not certain what such future facilities would be, and since the requirements on those facilities for Delta, Marsh and Bay protection are yet unknown.

Comment: The statement on page IV-7 of the Draft EIR indicating that Fish and Game developed the average Striped Bass Index expected under without project conditions is not true. This information was developed by Board staff. Fish and Game noted in its comments that the Board's analysis underestimated the index for numerous reasons. We concur with Fish and Game. We also feel that application of a mathematical correlation between June/July outflows and young-of-the-year striped bass, is valid only if we assume that no other factors influencing striped bass populations were different. Considering the major reductions in Delta outflow and increases in Delta exports and use of Delta channels at other times of the year, and all of the evidence that such matters are detrimental to the environment of the Delta, it is irrational to accept that assumption. (DEAC)

Response: DEAC is correct in asserting that the statement related to without project conditions is Board staff analysis. However, the staff worked closely with Fish and Game in developing these estimates.

Board staff has discussed DEAC's concern over the adequacy of the Striped Bass Index estimates at length with DEAC consultant Don W. Kelley, and Fish and Game. We agree with Fish and Game that these estimates are underestimates of without project conditions and have voiced Fish and Game's concerns in the Final EIR. However, we disagree with DEAC's opinion that utilization of these values is irrational. We

agree that they should be refined in the future as better information becomes available, but feel that they have utility if used carefully, knowing the limitations of the information. In their comments on the plan Fish and Game supports this approach.

Comment : The first paragraph on page IV-14 of the Draft EIR describing the use of the young-of-the-year Striped Bass Index to estimate historical levels, should be rewritten eliminating the reference to "without project levels". The calculation of "historical levels", using the correlations between 1959 through 1967 May/June and July outflows and the young mid-summer populations of the young-of-the-year striped bass, do not suffer the major deficiencies of using those same correlations to calculate without project levels.

The rest of the discussion implies that sufficient knowledge exists to develop outflows necessary to achieve recent historical levels with present facilities. We have not yet achieved that high a level of precision in managing the estuary to overcome the effects of the export facilities. (DEAC)

Response: The reference to page IV-14 of the Draft EIR describing the methodology used in developing the without project levels is intended to help the reader understand that the techniques involved here are the same, not that the assumptions are necessarily the same.

The discussion has been revised to indicate the uncertainty of reaching historical conditions for striped bass with the outflow and export rates identified under alternatives IIIA and IIIB of the EIR.

Comment: In describing the development of the historical protection alternative with present facilities, the statement made on page IV-17 of the Draft EIR that "The recommendations made in Fish and Game Exhibit 11 relative to physical operations of the present Delta facilities with the CVP and SWP, and the flows required for salmon appear adequate to achieve the stated goals of this conceptual alternative (preservation of all fish and wildlife at historical levels)", is not true. Conditions for anadromous fishes would require that positive downstream flow in all Delta standards be required. The paragraph should point out that no analysis of historical levels of fish, other than striped bass, have been made, but that catfish, largemouth bass, and other resident fishes and wildlife of the Delta cannot be restored to historical levels so long as the interior Delta channels are used as the principal canals to convey large quantities of water to the export pumps. (DEAC)

Response: So long as reverse flow conditions are permitted to exist it is doubtful whether historical fishery levels could be maintained regardless of Delta outflow. For this reason, a requirement for positive net downstream flow in all major Delta channels has been added under the historical protection alternative. Even with this modification, it is uncertain whether this would achieve historical levels for all fish species. More information as to the environmental needs of these species is needed before such statements could be made.

Comment: In describing Alternative IIA (Draft EIR, p. IV-21) the sentence "The mitigation level of protection would be provided the fishery resources (conceptual alternative C)", should be deleted and a statement added to the effect that the damages to fish and wildlife resources of the Estuary would be only partially mitigated by this alternative. (DEAC)

Response: This paragraph has been modified.

Comment: We do not believe the report lays an adequate foundation for concluding that the analysis of the alternatives' impact on striped bass spawning and survival, salmon migration and Suisun Marsh waterfowl food supplies provides sufficient basis for evaluating the impacts on other fish and wildlife resources.

In the last paragraph, the statement "The water quality objectives designed to protect the specific environmental resources are expected to protect other species as well", is a misunderstanding of the Department of Fish and Game's intention and is directly contrary to the testimony of the U. S. Fish and Wildlife Service. (DEAC)

Response: The passage "protect other species" has been changed to "benefit other species". Available information does not allow us to quantify the impacts of this plan on all fish and wildlife species in the estuary. Rather, a few key species have been selected for which data does exist. Inferences as to the protection afforded other fish and wildlife species can be made only where the mix of environmental requirements are similar to those of the key species chosen. The Final EIR does show how outflow and export will likely change under the recommended plan and how this change might affect various fish species.

Comment: We do not understand the logic which connects the two sentences -- (Draft EIR, page V-16) "Striped bass have a pronounced tendency to return to the same spawning area each year. Thus, occasional occurrences of less than optimum salinities might have little effect on striped bass". Why does it matter where striped bass spawn, or how many miles of spawning area are available? Location is important primarily because currents should move their eggs and larvae into places where there will be plenty of food when the young hatch, and need it, and where they will be safe from the dangers of being exported through the SWP/CVP pumps. The EIR should describe how various plans will affect that. We cannot see that simply

describing the miles of suitable spawning habitat under the various alternatives is of any use at all. (DEAC)

Response: The expected impact on young bass due to low flows and high export rates is illustrated through the use of the Striped Bass Index. The period of time covered by this analytical technique is May through July. Some spawning does occur by mid-April, but the impacts of the projects on young bass and eggs is addressed through the use of the May-July environmental conditions.

The paragraph cited by DEAC states: "The impacts of the various alternative plans on striped bass spawning are extremely difficult to assess since the actual effects on exceeding the 1.5 mmhos EC limit are uncertain." It goes on to state that the prolonged occurrences of less favorable salinities, however, could gradually reduce spawning in the area due to accumulative effects of either small differences in survival or migratory preferences. The EIR attempts to give the reader a "physical feel" for the extent of these possible changes. We agree that conclusions as to real impacts are difficult to assess but this is the state of current knowledge.

Comment: The Striped Bass Index can be used as one tool to help evaluate the various plans, provided it is carefully presented and modified with a sound description of how relevant its use is to that particular alternative. It is not the only available tool and it is not applicable at all to other species. (DEAC)

Response: Although DEAC alludes that other tools are available to assess impacts on striped bass, they fail to state what these might be. The Board, in the EIR, sought to describe the consequences of its decision in terms which the public can understand. The Board recognizes the limitations behind the use of the Striped Bass Index and has taken this into consideration in its decision-making process.

Comment: On page V-20 of the Draft EIR, the sentence "The above analysis yielded the expected Striped Bass Index for each year in the 50-year planning period", should be changed to something like the following: "Assuming that other factors which influence striped bass would remain the same, and/or their influence on the striped bass would not change significantly, the above analysis is a rough estimate of what the Striped Bass Index would be for each year in the 50-year planning period under the various alternative plans." (DEAC)

Response: The wording has been changed to reflect this suggestion.

Comment: The effects of the various alternatives on salmon are not analyzed in this report and they must be. Testimony by Fish and Game was that salmon populations are being damaged by the projects and that the damage will continue until a properly designed and operated Delta transfer facility is in place. (DEAC)

Response: The impacts in the Delta to Sacramento River salmon migration are difficult, if not impossible, to quantify from available information. Young out migrating salmon are probably more affected by the projects than are the stronger swimming adults. Figure III-20 in the EIR shows the general times of year that young salmon are migrating out of the estuary

to the ocean. Out migration of all runs of salmon occurs during the winter and spring, peaking in April or May, and continuing into July. The types of conditions that adversely affect young salmon on the Sacramento system are low flow conditions, high exports, and the diversion of young into the interior Delta, thus subjecting them to greater predation and making them more susceptible to the effects of export pumping. The Delta Plan results in higher flows during peak out migration of young salmon than the existing basin plan except in some months in dry and critical years. In addition, the Delta Plan calls for the closure of the Delta Cross-Channel gates to minimize the diversion of young salmon into the interior Delta, and places limits on export rates in all years during this critical period. This qualitative comparison leads to the conclusion that the plan would be better for salmon than the existing basin plans in most years. The Final EIR has been modified to include this discussion.

Comment: Could the implementation of Fish and Game's recommended salinity schedule in the Marsh narrow the range of beneficial uses by diminishing species diversity? It would appear that the reduction of species diversity could have a profound impact on the Marsh area. In a "dwindling habitat" such as the Suisun Marsh, a more thorough study should be conducted prior to implementation of such a plan. (State Lands Commission)

Response: The Board's Suisun Marsh standards require the implementation of Fish and Game's recommended salinity schedule at specific locations in the Marsh by October 1, 1984. It is

likely that the CVP and SWP will recommend and construct facilities to accomplish this requirement. Planning for these facilities is currently underway and must include the necessary environmental documentation. Therefore, the more thorough study requested by State Lands will be part of the planning for these facilities.

Current plans center around meeting the required standards through a combination of tidal pumping, enhanced circulation of water, relocation of water intake facilities and some augmentation of water supply from alternative sources. The envisioned net result will be that the water quality at the locations in the Marsh closest to the Bay will be at least as good as the standards requiring conditions in the interior of the Marsh to be substantially better. Gradients of water quality will therefore be established much as they are under natural conditions. Such gradients will allow for diversification of habitat. The specifics of these gradients depend on the facilities selected by the CVP and SWP.

XI

COMMENTS OF LEGISLATORS
AND
U.S. ENVIRONMENTAL PROTECTION AGENCY

PLEASE REPLY TO:
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Assembly California Legislature

MEMBER:
INTERGOVERNMENTAL RELATIONS
COMMITTEE
WATER COMMITTEE
JOINT LEGISLATIVE AUDIT
COMMITTEE
JOINT LEGISLATIVE BUDGET
COMMITTEE
WILDLIFE CONSERVATION
BOARD
REPRESENTING
TENTH ASSEMBLY DISTRICT
CONTRA COSTA COUNTY

DANIEL E. BOATWRIGHT
CHAIRMAN

Committee on Ways and Means

May 30, 1978

John E. Bryson, Chairman
State Water Resources Control
Board
P.O. Box 100
Sacramento, California 95801

Dear Mr. Chairman:

As a legislator from Contra Costa County in the Sacramento-San Joaquin Delta area, I am angered by the failure of your Board to propose high water quality standards in the proposed Water Quality Control Plan for the protection and enhancement of the Delta and the invaluable Suisun Marsh. This proposed action by your Board is doubly troubling when it is considered in light of the clear and unequivocal mandate of the Delta Protection Act (Water Code Sections 12,000 to 12,205) that the Delta's water resources and beneficial uses must be fully protected before any water can be exported from the Delta.

The Plan is a disaster for the Western Delta; the area that I represent. For example, it proposes to eliminate water quality objectives at Antioch to protect the many municipal and industrial uses of water in the Western Delta. In lieu of diverting good quality water from the channels in the Water Delta pursuant to the exercise of senior vested water rights the Plan proposes that a substitute supply of water be provided through the Contra Costa Canal. The vice in such a proposal is two-fold:

The first is that your Board has no legal power and authority to infringe upon the valuable water rights held by senior water right owners in the Western Delta or anywhere else. Any such proposal for a substitute supply and the implementation thereof is properly the subject of contractual negotiations between those senior water right owners and the water project operators (or a water right adjudication).

The second is that the Plan does not assure good quality for the salt-sensitive industries that operate in my district. The Plan does not provide the good quality water which has been historically enjoyed by diverters in the Western Delta.

The Plan fails to provide protection for agriculture in the Delta, particularly in dry and critical years.

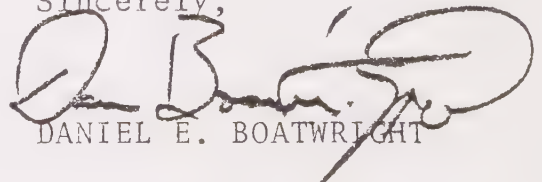
It fails to properly protect the Suisun Marsh, particularly in dry and critical years.

The Plan fails to provide any objective or standard whereby the high natural flows of fresh water through the Delta during the runoff period will be maintained in the future to provide "flushing flows" for the Delta and the San Francisco Bay.

The Board must comply with the provisions of the Delta Protection Act. Section 12202 unequivocally states that the State Water Project must provide adequate salinity control for the Delta and "an adequate water supply for the users of water in the Sacramento-San Joaquin Delta". Section 12203 prohibits the diversion of water in the Delta to which the users in the Delta are entitled. Section 12204 prohibits the export of any water from the Delta which is needed to protect and preserve the beneficial uses of water in the Delta.

The Board must further comply with the applicable federal and state water quality laws that require the protection and maintenance of existing water uses. In other words, the law requires the Board to upgrade water quality and to protect existing water uses; not to downgrade water quality to permit the export of water.

Sincerely,



DANIEL E. BOATWRIGHT

DEB:md

Honorable Daniel E. Boatwright
State Assemblyman
State Capitol, Room 3091
Sacramento, CA 95814

Dear Mr. Boatwright:

You express in your letter of May 30, 1978 concern regarding the Board's Draft Water Quality Control Plan for the Sacramento-San Joaquin Delta and Suisun Marsh. This letter seeks to respond to the issues which you raised.

At the outset, I would like to point out that the draft plan provides generally a significantly higher level of protection for beneficial uses in the Delta than existing water quality control plans (basin plans).

The basic principle of the draft plan is that water quality in the Delta should be no worse than those levels that would have existed had not State and Federal projects been constructed, as limited by reasonable use.

The application of this principle to agricultural uses in the Delta results in substantially greater protection in the Delta for such uses than that provided in the existing basin plan. The agricultural standards in the basin plan represent criteria that have not changed for over 13 years and are based on the water quality needs of the Bureau's Tracy Pumping Plant. I believe most Delta interests would agree that the water quality standards in the draft plan are a vast improvement over the basin plan standards.

The fishery standards of the proposed plan are taken essentially from a four-agency agreement developed through five years of extensive negotiation between the Department of Water Resources, U. S. Bureau of Reclamation, Department of Fish and Game and U. S. Fish and Wildlife Service. These criteria were recommended by the Department of Fish and Game and endorsed by the Department of Water Resources. Even though the fish and wildlife standards were not developed by the Board, they have been subjected to extensive analysis by the Board staff. Based on our most current assessment, the fishery standards provide significantly higher protection than the existing basin plans. The Striped Bass Index, a measure of young bass survival through their first summer, is used as an indicator of fish

abundance in the Delta. The Striped Bass Index would be greater than 71 under without project conditions but only 63 under the existing basin plans. However, under the draft plan the Striped Bass Index would be about 80.

Full protection of Suisun Marsh now could be accomplished only with freshwater outflow. Protection of the Marsh solely with freshwater outflow would require up to 2 million acre-feet in dry and critical years in addition to that required to meet other standards. This would result in a one-third reduction in combined exportable yield of State and Federal projects. In theory, the basin plan purported to provide full protection to the Marsh; however, during the 1976-77 drought when the basin plan was in effect, the Marsh received little if no protection. Unlike the basin plan, the draft plan recognizes the limitations of available water supplies. In addition, the draft plan makes very clear that Marsh protection is a mitigation responsibility of the projects.

The Bureau, the Departments of Water Resources and Fish and Game, and U. S. Fish and Wildlife Service are working to develop alternative supplies for the Marsh. Such alternative supplies are a more desirable method for protection of the Marsh and mitigation of the adverse impacts of the project. Until needed physical facilities are constructed, interim standards are provided in the draft plan to protect the Marsh. Full protection of the Marsh would be required by 1982.

Currently, San Francisco Bay is protected through unregulated flows. Since no additional project facilities are expected to be completed for the next 10 years, current levels of unregulated Delta outflow should not be appreciably depleted during the effective period of this plan. Full consideration will be given to the unregulated outflow needs of San Francisco Bay in the Board's periodic review (within three years) of the standards in the plan.

In the meantime, the draft plan provides policy guidance to water development agencies to ensure full consideration to San Francisco Bay needs in evaluating possible future water development facilities.

Regarding municipal drinking water supplies, the level of protection in the draft plan is the same as that of existing basin plans; however, the period over which salt sensitive industries would be protected is somewhat shorter under the draft plan than in the basin plan. The level of protection provided in the draft plan would be equivalent to conditions offshore of Antioch which would occur in the absence of the Federal and State projects.

Under historical conditions, industries in the vicinity of Antioch have benefited by the operation of project facilities,

especially during the period 1945-67. After 1967, when the State Water Project commenced operations and demands on the Central Valley Project increased, the benefits of project operations decreased and will continue to be reduced. The senior water rights of these industries do not entitle them to flows which are in excess of natural flow conditions in the Delta. If without project conditions in the Delta, as limited by reasonable use, are provided by this plan, vested water rights will be protected against infringement by the Department and Bureau. However, in accordance with the Delta Protection Act, if Delta water users desire additional benefits, they can seek such benefits from the project operators.

In comparing the relative protection provided by the draft plan to that of the basin plan, consideration must also be given to conditions relatively certain to occur if the draft plan is not adopted. In this context it should be kept in mind that under conditions similar to the 1976-77 drought the salt sensitive industries would receive considerably greater protection under the draft plan than that actually experienced during the drought.

I agree with the statement in your letter that the Board has no authority to infringe upon senior vested water rights. In fact, the underlying principle of the draft plan is to ensure that vested water rights in the Delta are not encroached upon by project operations.

From a purely water rights standpoint, water rights of users in the vicinity of Antioch would not be infringed upon by the substitute supply; however, the substitute supply must be of like quantity and quality and must be provided at no additional cost. Provision of the substitute supply is also in accordance with the Delta Protection Act (Section 12202 of the Water Code). Under this act, if it is determined to be in the public interest, a substitute supply can be provided by project operators in lieu of in-channel quality.

During the public hearing on the draft plan the Department of Water Resources requested the Board to make such a determination regarding the salt sensitive industries in the vicinity of Antioch. The current Antioch standard in the basin plan includes a termination provision which would void the standard upon a determination by the Board that adequate supplies are available to all municipal and industrial users in the vicinity of Antioch. For each acre-foot of water diverted offshore at Antioch, 25 acre-feet of freshwater must flow out of the Delta to repel seawater. In view of this fact, public interest considerations support the provision of a substitute supply. Thus, even if the draft plan were not adopted, the Board would be required to make such a determination. However, the details of how such a substitute supply would be provided is properly a subject of negotiation between the project operators and water right holders.

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In summary, we believe that the draft plan is within the intent of the Delta Protection Act. It ensures that no water to which Delta vested water right holders are entitled will be exported out of the Delta. We have clearly stayed within the authority delegated to the Board by the Legislature. As indicated above, the draft plan affords substantial improvement in water quality to beneficial uses in the Delta. We would be pleased to meet with you or your representative to discuss in detail any aspect of the draft plan.

Sincerely,

Respectfully Signed By

John E. Bryson

John E. Bryson
Chairman

Specific Comments of U. S. Environmental Protection Agency.

The EPA comments overlap to some extent concerns voiced in previous comments by others. Where substantial overlap occurs, reference is made to more complete discussions elsewhere in the Appendix, appropriate chapters of the EIR and the Delta Plan. EPA's comments concern the general approach taken in the Delta Plan to beneficial use protection, proposed refinement of individual standards, and the adequacy of the EIR.

Comment: The plan must list all beneficial uses, for each segment of the Delta system. If available information does not suffice for the adoption of objectives for each beneficial use, the plan must describe a program and implementation schedule to develop such objectives.

Response: We are unsure of EPA's meaning of Delta system "segments". The Delta Plan identifies Delta and Suisun Marsh beneficial uses, and, as is common in estuaries, most are not limited to specific geographical locations or segments. In terms of standards and an implementation program, the plan, in general, provides what EPA recommends. Specific areas in which it may not do so are discussed in some of the responses to the following EPA comments, or in the references contained therein.

Comment: The proposed plan has not demonstrated that the protection of striped bass as a key species will provide adequate protection for other Delta fish and wildlife beneficial uses. Multispecies criteria should be developed to adequately protect fishery as a beneficial use of the Delta. The plan should list the other fishery beneficial uses to be protected and present a program and schedule for the SWRCB to determine what water quality objectives are required to protect optimum, historical, and minimum levels for maintenance of salmon, shad, sturgeon, and resident species such as catfish, as well as striped bass.

Response: The Board agrees that the establishment of multispecies standards for fish and wildlife protection in the Delta is highly desirable. Present knowledge, however, does not allow us to develop such standards for species other than those key species selected by the Department of Fish and Game. When information is limited, the use of key species is a realistic and desirable means to provide Delta protection and is consistent with the rationale used in the EPA-approved basin plans. The Board realizes that caution must be used in utilizing such an approach. (See USF&WS comment V-8.)

The Board has required an extensive monitoring program as a water right permit condition that will expand the ecological knowledge of this estuary. Specific studies are also required on San Francisco Bay. Past studies of this type begun in 1959 have led to the development of the current striped bass standards. Because of the often long time frame necessary to develop understanding of the ecological dynamics of selected species (almost 20 years for striped bass, for which there still remain unanswered questions) it seems unrealistic to adopt a specific schedule by which water quality standards for other fish and wildlife species must be developed. The Board will continue to require in-depth studies and to develop standards for other species as information becomes available consistent with the Porter-Cologne Act and the reserved jurisdiction in the water right permits.

The striped bass standards will provide benefits to other fish species (see response to DEAC comment in Chapter X). The degree of benefit is not quantifiable with available information. However, the Final EIR in Chapter V, Section B, qualitatively assesses the protection that will likely be offered salmon, white catfish and shad by the recommended plan.

Comment: The water quality control plan should demonstrate why a Striped Bass Index of 106 need not be maintained during wet and above normal years.

Response: The average Striped Bass Index is based on the concept that the survival of young-of-the-year striped bass varies with hydrology. The recent historical Striped Bass Index of 106 is based on the estimated average conditions through the period 1922-1967, with the Index in wet years being higher than the Index in drier years.

Average without project conditions have been used as an appropriate interim goal against which current fishery standards have been assessed. The long-term goal of attaining historical fishery levels on the average is also addressed if any cross Delta water transfer facility is constructed. These goals are meaningful only as long-term averages over many year types; not as goals for specific year types as EPA suggests.

Wet and above normal years by definition account for 50 percent of historic hydrologic occurrences. A minimum Striped Bass Index

of 106 in wet and above normal years would result in average protection that would approach if not exceed the historical average of 106. The EIR evaluates the attainment of average historical fishery protection with current project facilities in the Delta. The EIR shows that to attain this level of protection would require both depletion of upstream storage to provide large Delta outflows and heavy pumping restrictions to overcome the detrimental effects of the export facilities in the southern Delta. After evaluating these effects, the Board has determined that the attainment of the recent historical Striped Bass Index with current project facilities is not in the public interest at this time.

Comment: The proposed water quality standards would not protect the beneficial uses of Suisun Marsh. The limited interim protection of the Marsh provided by the plan appears to rest principally on other controlling objectives and carriage water requirements. The plan should provide water quality standards sufficient to protect all beneficial uses of the Marsh, under present operational conditions, until such time (projected for 1984) as alternative systems or facilities capable of maintaining and protecting the beneficial uses of the Marsh are implemented.

Response: The standards have been revised to increase interim protection to the Marsh. Additional interim protection to Suisun Marsh results from uncontrolled Delta outflows. These uncontrolled outflows occur to a great extent in the winter and spring of almost every year. The effects of these uncontrolled outflows are taken into account in determining the Marsh impacts listed in Table V-1 of the EIR. However, provision of full

protection now solely with outflow until Suisun Marsh mitigation facilities are constructed would not be in the public interest.

Comment: The proposed plan requires a disproportionate degradation in Delta beneficial uses as compared to the reduction in beneficial uses for export and non-project purposes. The final plan should (1) modify the relaxation provision in Table VI-1, page VI-33, to establish an absolute minimum level of protection for Delta beneficial uses; (2) improve protection of Delta fishery beneficial uses in dry and critical years by increasing the level for striped bass survival in these years; and (3) modify the relaxation provision in Table VI-1, page VI-33, to be based on deficiencies in firm commitments to water users in 1978.

Response: The relaxation provision for striped bass spawning in Table VI-1 of the plan has been modified to include a minimum level of protection. In determining the level of protection for striped bass, the Board attempted to approach mitigation levels. While these mitigation levels cannot be quantified absolutely, it is thought that mitigation would be an average Striped Bass Index somewhat greater than 70. The standards provide for an average Striped Bass Index of 79. Therefore, we do not believe that modification is warranted in the level of protection afforded to striped bass in any year type, including dry and critical years.

Finally, the Board believes that the striped bass spawning standard relaxation provision is appropriate, and Chapter VII in the EIR states that the potential of a significant environmental impact to striped bass spawning of this relaxation provision is

considered insignificant. However, studies currently underway by Fish and Game should determine the extent of these impacts, and the Board will consider results of these studies in future review of standards.

Comment: The proposed water quality standards do not protect the beneficial uses of the South Delta. The State Board should reinstitute the existing standard at Vernalis, establish standards to protect fish and wildlife, and make the future agricultural standards effective now, with a schedule for implementation of the agricultural standards as a part of the plan. (EPA)

Response: The Board's position in regard to southern Delta agricultural standards is realistic, and reflects the current situation in regard to infringement of vested rights and lack of adequate water quality to protect beneficial uses. The interim standard at Vernalis is appropriately tied to operation of New Melones, consistent with the agreement between the Bureau and the Central Valley Regional Board. While the operational status of New Melones will depend on the unpredictable fluctuations in hydrology over the next few years, we anticipate that releases from New Melones may be available to meet the Vernalis standard beginning in water year 1980.

As discussed in Chapters V, VI, and VII of the plan, implementation of southern Delta agricultural standards will be handled either through negotiations between the SDWA and the project operators or through Board enforcement action. The plan sets a deadline

for consummation of negotiations, but leaves open the duration of any required enforcement action. We are presently unsure of the time needed for such enforcement action, if it is necessary at all. Any implementation time schedule adopted for southern Delta agricultural standards would be purely speculative at this time.

Finally, Chapter VII of the plan and Chapter VI of the EIR have been revised to include policy guidance related to protection of the southern Delta fishery. This is also discussed in response to a comment by DEAC in Chapter X, Section C of this Appendix.

Comment: EPA believes that the beneficial use of agriculture is not adequately protected by the plan. Unless improved water management techniques are implemented by Central Valley and South Coast users, the proposed yield decrements in Delta agriculture will result in unnecessary and unacceptable reductions in this beneficial use.

The plan should demonstrate that sufficient water quality will be made available to satisfy irrigation, subirrigation and leaching requirements of Delta agriculture since subirrigation and leaching occur virtually throughout the year and are not arbitrarily started April 1 and terminated August 15, the days of protection indicated in the plan. Alternately, the plan should describe a program and implementation schedule to develop objectives to preserve the irrigation, subirrigation and leaching beneficial uses.

Response: The level of protection provided agricultural uses in the Delta is substantially better than that provided in the basin plan. Any crop decrements experienced under the recommended plan will be considerably less than that which would occur under the basin plan. Also, the recommended plan does not propose yield decrements as inferred in EPA comments, but rather attempts to

minimize the occurrence of such losses consistent with the water rights of agricultural users. Thus, the level of protection to Delta agriculture is not dependent on improved water management techniques implemented by other agricultural users in the Central Valley and South Coast area.

The discussion of agricultural water quality needs in Chapter III of the EIR recognizes the necessity of establishing water quality standards for leaching and preirrigation. However, sufficient supportive data to establish such standard now is lacking. Chapter VII of the plan has been revised to include a discussion of studies needed to provide the necessary information. We refer EPA also to discussions in Chapter III, Section D of this Appendix.

Comment: The plan does not establish San Francisco Bay water quality as a beneficial use of Delta outflows or any objectives to maintain dependent San Francisco Bay beneficial uses. The plan instead postpones establishing these because of inadequate data. The anti-degradation provisions of the Clean Water Act require that both of these be thoroughly investigated. During the time period required to develop such standards adequate outflows should remain uncommitted to insure that such standards may be implemented.

Response: The matters of San Francisco Bay and the Clean Water Act (Federal Water Pollution Control Act) are discussed in some length in the Delta Plan, the EIR and Chapters II and VI of this Appendix.

Comment: The Board should provide a detailed justification of each reduction in protection of a beneficial use proposed as part of this plan. This information must be developed for each segment of the Delta system, to justify each reduction in

level of protection of a beneficial use within that segment, for each water year type, so that a record will be established pursuant to Section 303 of the Clean Water Act of 1977 and the Part 130-131 regulations.

Response: Adequate information answering this concern is found in Chapter V of the EIR, and in various other sections of the EIR and in the Delta Plan, dealing with the Board's authority, vested rights, reasonable use and public interest.

Comment: The plan must demonstrate that there will be no significant adverse impact on fish and wildlife beneficial uses as a result of the elimination of Antioch standards.

Response: The 1975 Basin Plan standard at Antioch is identified as protecting western Delta municipal and industrial water users. The standard has the following provision: "These objectives shall not apply when the State Board determines that adequate substitute supplies are available to all existing municipal and industrial water users located in the vicinity of Antioch and Pittsburg." Therefore, the EPA approved 1975 Basin Plan allows the elimination of the Antioch standards, subject to the determination of substitute supplies made by the Board in the Delta Plan. Table V-1 in the EIR compares fish and wildlife impacts of both the 1975 Basin Plan and the Delta Plan. Chapter V of the EIR discusses these impacts in detail.

Comment: Figure II-1 of the plan sets forth year classifications and types and provides separate dual systems of less stringent objectives for the year following a critical year. The plan has not demonstrated that fish and wildlife breeding populations can actually recover sufficiently under these circumstances. In

addition, if a dry or critical year(s) prevented winter leaching in the Delta, salt buildup in the soil could cause serious problems in production in the short run and, if prolonged, possible long term damage to the physical characteristics of the soil column. The impact of these relaxed objectives on Delta beneficial uses must be quantified and the results justified.

Response: The year classification system has been modified by eliminating the "Year Following Critical Year" designation for agricultural, municipal and industrial standards, consistent with protection of those uses in accordance with vested water rights.

Testimony received in the hearings generally supports the Board's approach to fishery standards that greater protection to fish be provided in wet years and less protection be provided in drier years. This is generally the cycle of protection historically provided by nature, under which estuarine organisms have developed and adapted. We believe that the fishery standards in the plan provide adequate protection consistent with the public interest at this time. However, we will review these standards against their actual future impacts, and revise them as necessary.

Comments: The Delta Outflow Index by itself does not constitute a sufficient water quality objective. It will be necessary to adopt water quality objectives in measurable terms, such as total dissolved solids, chloride or electrical conductivity, that provide salinity repulsion control corresponding to the intent of the Index limits to protect all beneficial uses.

Response: Those standards which are stated in terms of the Delta Outflow Index are solely for the protection of fish and

wildlife beneficial uses. Standards for municipal, industrial and agricultural uses are stated in terms of specific salinity requirements at specific stations. In the case of flow requirements for striped bass survival and salmon migration, fishery experts have indicated to us that flow is the parameter to which the fish are responding, and not salinity. The flow standards for interim protection of Suisun Marsh are a reflection that uncontrolled flows are the primary mechanism for such protection until such time as permanent protection is assured. A program for permanent protection of Suisun Marsh beneficial uses is outlined in Chapter VII of the Delta Plan.

EPA has often voiced concern about the Delta Outflow Index being only an estimate of actual flow conditions, rather than a direct measurement. We share EPA's concern, and the program of implementation in Chapter VII of the Delta Plan requires the project operators to improve the determination of Delta outflow. However, evidence indicates that the Outflow Index correlates fairly well with fishery response during the times of the year when flow standards apply. On this basis we believe that flow standards in terms of the Outflow Index are appropriate until better information is available.

Finally, the U. S. Geological Survey is taking the lead in proposing a study that would reevaluate the potential for

direct measurement of Delta outflow. The Department and Bureau are participating in this study. We also feel that this program may yield valuable information, and have offered our support. Financial support by any other state or federal agency which shares concerns about Delta outflow measurement would be welcome.

Comment: The present basin plans contain temperature and sediment standards which place restrictions on increasing temperature or sediment levels above natural levels. The reduced flow which will be permitted in dry and critical years by this plan may result in increased background levels of temperature and sediment in Delta channels. The plan should identify those areas where such changes may occur, and should determine if these changes will have an adverse impact on Delta fish and wildlife beneficial uses. Similarly, the plan should analyze whether increased biostimulation may result from reduced channel flows, and whether this will cause an adverse impact on fish and wildlife beneficial uses.

Response: The plan will only amend the present basin plans, and will not alter the water quality objectives for temperature, sediment and biostimulation that currently exist in these plans.

We do not expect sediment levels to increase as a result of reduced Delta outflows in dry and critical years, and data from 1977 showed that sediment actually decreases with decreased flows. This is probably due to reduced upstream runoff and lower stream velocities, resulting in less soil erosion and suspension.

It is not possible at present to quantify the effects of dry and critical year outflows on temperature, but it is possible that

temperatures will increase somewhat over those found in wetter years. Factors that could affect the temperature regime include dry year changes in upstream agricultural water uses, alterations in schedules of hydroelectric power generation, and releases of water from major upstream reservoirs coupled with increased percentage of stream flows attributed to reservoir releases.

Finally, the experience of 1977 indicates that no good predictive model exists for biostimulation levels in the Delta and Suisun Marsh. EPA staff is aware of some of the work done in this regard by Hydrosience, Fish and Game, the Department and the Bureau. Data from 1977 indicates that extreme low-flow conditions and warm water temperatures generally did not result in any significant degree of biostimulation, and certainly much less than expected. Flows under the plan are not expected to approach the low-flow conditions of 1977. We will continue to monitor work underway by other agencies in developing and improving predictive models for a wide range of water quality parameters in the Delta and Suisun Marsh.

Comment: The proposed water quality standards would not appear to protect the health of municipal consumers of drinking water withdrawn at the Delta Mendota and Clifton Court intakes and at Cache and Rock Sloughs. The water quality standards should provide that potable supplies withdrawn at any intake would not contain sufficient precursors so as to cause the proposed maximum contaminant level for total trihalomethanes to be exceeded.

Response: The proposed regulations referred to by EPA relate to treatment processes to ensure that the proposed standard of 100 parts per billion trihalomethanes is not exceeded in public drinking supplies. Studies principally by the Contra Costa County Water District during the recent drought showed that as chloride concentrations at their treatment plant increased above about 100 parts per million, the trihalomethanes produced as a result of their chlorination process approached or exceeded this standard. As seawater intrusion increased, the formation of these suspected carcinogens also increased. It is believed that bromide, a compound in seawater, and chloride ions are made reactive during the chlorination process. These reactive compounds attack the naturally occurring organic materials found in Delta waters to produce trihalomethanes.

EPA proposed regulations are basically a treatment technique requirement. They initially require that community water systems with populations greater than 75,000 people use granular activated carbon in their drinking water treatment systems by a certain date. EPA believes that this treatment is the best broad spectrum technology presently available for the control of organic chemicals in drinking water. Those water systems that demonstrate this treatment is not necessary to protect the health of the people they serve may be granted a variance. Unless a water system is granted a variance, it will be required

to design, construct, and operate a granular activated carbon system or an approved alternative system to reduce the level of synthetic organic compounds to the maximum extent feasible. All affected water systems will have two and one-half years to comply with these regulations.

In that the organic precursors to the formation of trihalomethanes are naturally present in the Delta, concern has focused on ocean derived salinity. The existing basin plan did not provide that water of sufficiently low salinity to meet EPA's proposed standard exist at the Contra Costa Canal Intake for over one-third of the year. Therefore, under the "no action" alternative (basin plan) the Contra Costa County Water District would have been required to implement the required treatment. This will also be the case under the proposed plan. The district is currently evaluating the extent of the trihalomethane problem in the Delta, various alternative treatment processes, and other means to meet EPA's proposed regulation. Preliminary information suggests that if the trihalomethane standard is revised downward (as some expect), the high organic content of Delta waters will require extensive treatment for organic compounds regardless of salinity.

The nature of the EPA regulation is to require extensive treatment except in those areas that can demonstrate that

they do not face problems related to organic compounds in their delivered water. The Board does not believe that requiring excellent salinity at all municipal intakes is sufficient to remove the concern regarding organic chemicals in Delta drinking supplies. The Board will work closely with all agencies concerned with this problem to assist them in identifying the extent of this natural water quality related problem.

XII. OTHER MATTERS

Comment: Would like cross-examination of witnesses to consider evidence presented at May 30, 1978, hearing and all evidence by written submittals on June 15, 1978. (CDWA)

Response: The May 30, 1978, hearing was held to receive oral and written comments on the draft water quality control plan and the Draft EIR. This hearing was not held to receive additional direct evidence, but rather to obtain public input on the adequacy of the draft plan and Draft EIR. Since the information was received only for this limited purpose, cross-examination by interested parties is not called for.

Comment: Requested that the evidentiary phase of the hearing be reopened to present additional evidence. (CDWA, SDWA)

Response: The draft plan was based on 32 days of evidentiary hearing over a one-year period. Federal and state procedures provide for periodic review, at least once every three years, of water quality standards adopted by the Board. The Board has already made provisions to reopen the current hearing to receive additional evidence in several areas where information is currently lacking. Thus, since the current hearing will be reopened all parties will be given an opportunity to submit additional evidence.

Comment: One of the prime purposes of the five-page Summary is to outline major actions recommended in the draft plan. The Summary is written in a generalized narrative form which is not

easily understood and does not include specific recommendations. A comparative table to new objectives and a comparison with present objectives would be helpful in clarifying proposed actions. (Region 5)

The concept of a summary is excellent. We believe that it should include a history and philosophy of protection to the Estuary given by this Board, and a forthright discussion of the problems and deficiencies of the projects. (Sierra Club)

Response: The primary purpose of the Summary, to inform the lay public of major actions proposed in the draft plan, has been accomplished. Both the previous and new standards are sufficiently complex that incorporation of a table comparing these standards would require a lengthy discussion describing the standards, their development, their meaning, and their impacts on beneficial uses and the water projects.

However, the Summary will be revised to reflect the Board's decision on the plan.

Comment: The plan should be entitled a "salinity control plan" since it is specifically limited to salinity and, to a lesser degree, flow. (Region 5)

Response: Even though the principal focus of the plan is on salinity control, the Board's concerns regarding the effects of SWP and CVP operations on beneficial uses of Delta water supplies are not limited to salinity and outflow. The Board in its periodic review of standards will be considering other water quality parameters which may be affected by project operations. In view of this, the monitoring program outlined in the plan

includes measurement of phytoplankton, phosphorus, heavy metals, pesticides and benthos.

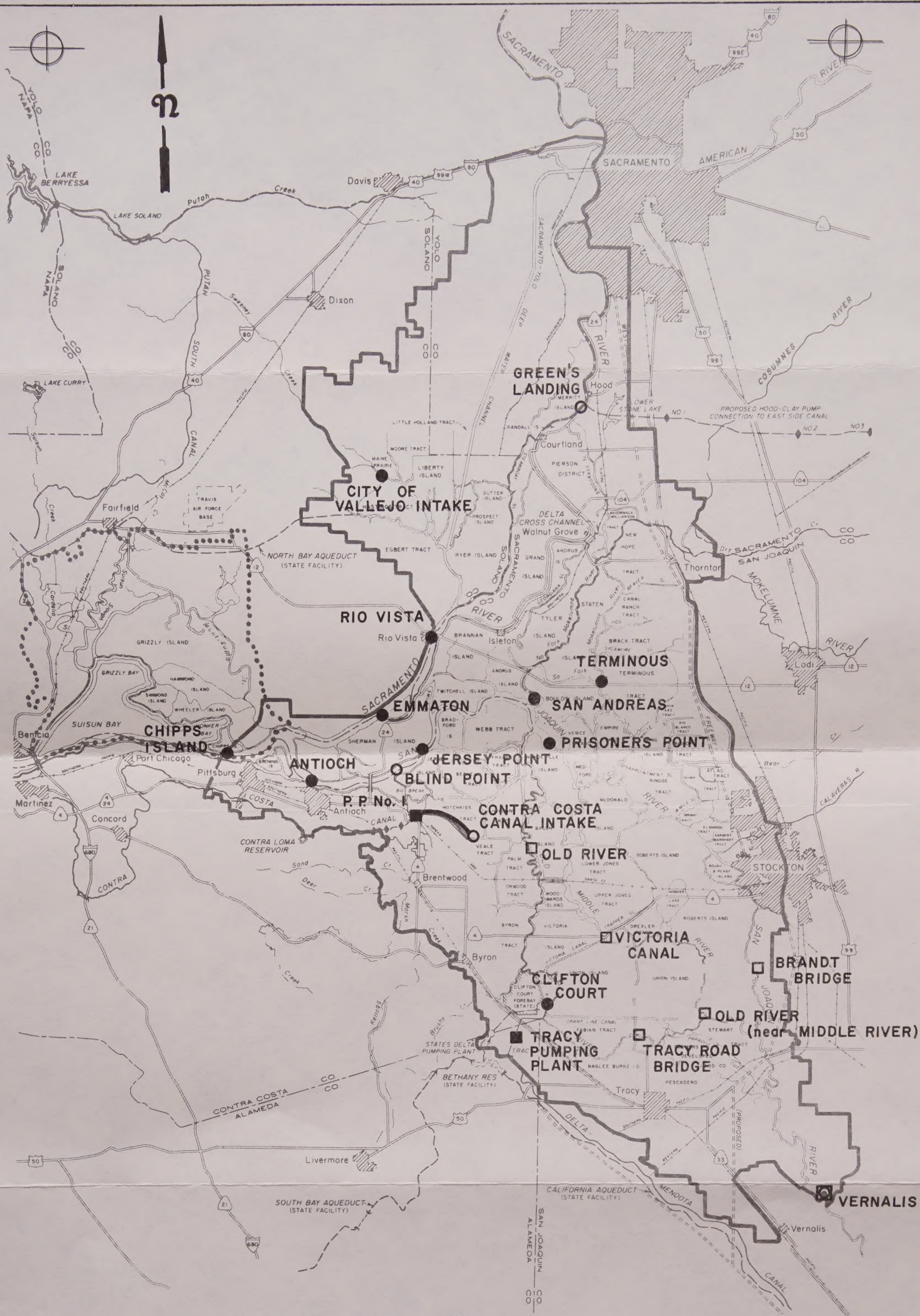
Comment: Some parties to the proceeding leading to development of the plan have expressed procedural and jurisdictional questions regarding matters such as combining of water right and water quality proceedings; the extent to which water right permits can be amended or conditioned; interpretation of various pertinent statutes; and limitations of the plan, both as to areal extent and water quality parameters considered (CCCWD, TLBWSD, CVESPA, CDWA)

Response: The procedures followed in development of the plan and water right decision and the limitations on the scope of the plan and decision are set forth in the plan and are based on the Board's water quality control and water right authority. This authority was clearly set forth in notices given to all parties to the proceeding.

Comment: In accordance with the California Environmental Quality Act and 36 CFR 800, a comprehensive Cultural Resources Program should be initiated. This program, conducted by qualified professionals of appropriate disciplines, should include the identification, assessment and impact mitigation measures designed for cultural properties located within the Sacramento-San Joaquin Delta and Suisun Marsh, which may be eligible for inclusion in the National Register of Historic Places. (DPR)

Response: The Delta Plan establishes salinity standards for the Sacramento-San Joaquin Delta and Suisun Marsh. The water right decision conditions the permits of the CVP and SWP to require the standards for the Delta to be met by the operation of existing project facilities. Since no physical changes or new facilities are required in the Delta, no impacts will occur

to archeological, historical, or cultural resources. The salinity standards for Suisun Marsh would require the release of large quantities of water from project storage reservoirs in dry years. Therefore, the plan and water right decision provide for compliance with an interim level of protection until new facilities are proposed by the CVP and SWP. Long-term protection of the Marsh is expected to be accomplished with facilities to provide a substitute supply of fresh water for portions of the area. Environmental documents will be prepared by the agencies proposing specific physical facilities. Any potential impacts to archeological, historical or cultural resources due to those specific facilities will be disclosed at that time and appropriate action can be taken by the Board to require any necessary mitigation measures.



- HISTORICAL & CURRENT WATER QUALITY CONTROL STATION
 ○ HISTORICAL WATER QUALITY CONTROL STATION
 ■ NEW WATER QUALITY CONTROL STATION
 □ POSSIBLE FUTURE WATER QUALITY CONTROL STATION
 ◆ ◆ ◆ ◆ SUISUN MARSH BOUNDARY
 ————— LEGAL DELTA BOUNDARY

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD
O
SACRAMENTO-SAN JOAQUIN DELTA

NOTE:
BASE MAP BY THE BUREAU OF RECLAMATION

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